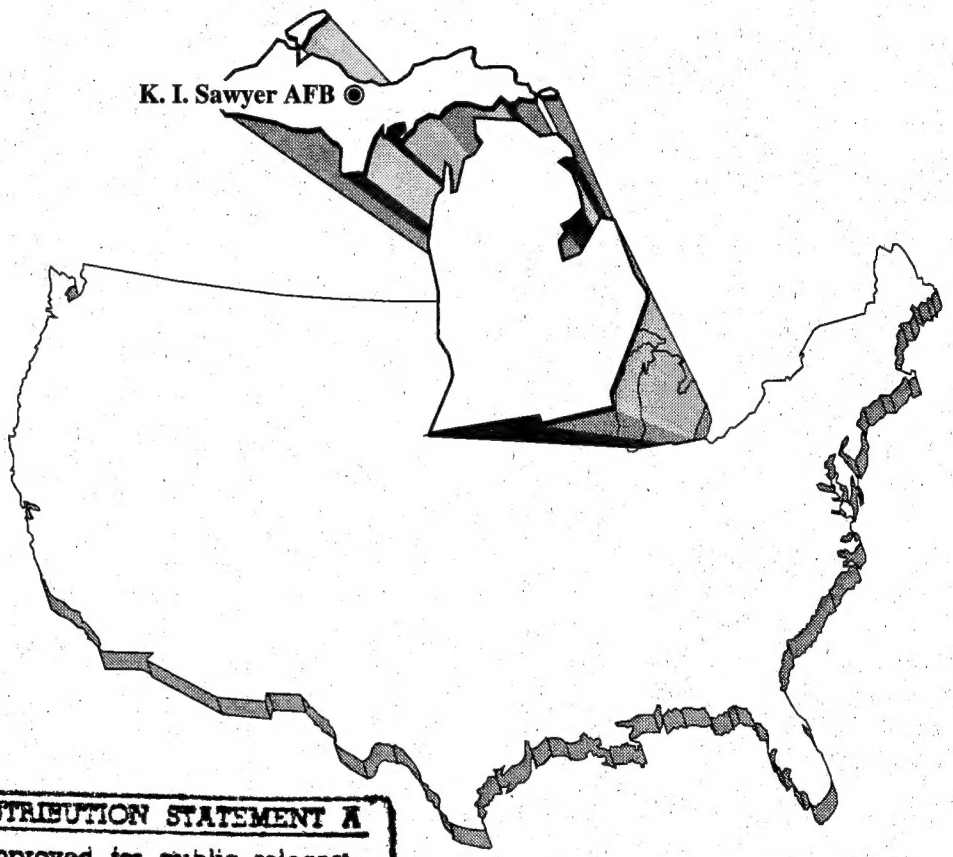
SOCIOECONOMIC IMPACT ANALYSIS STUDY
November 1995



DISPOSAL OF
K. I. SAWYER AIR FORCE BASE, MICHIGAN

SOCIOECONOMIC IMPACT ANALYSIS STUDY

DISPOSAL OF
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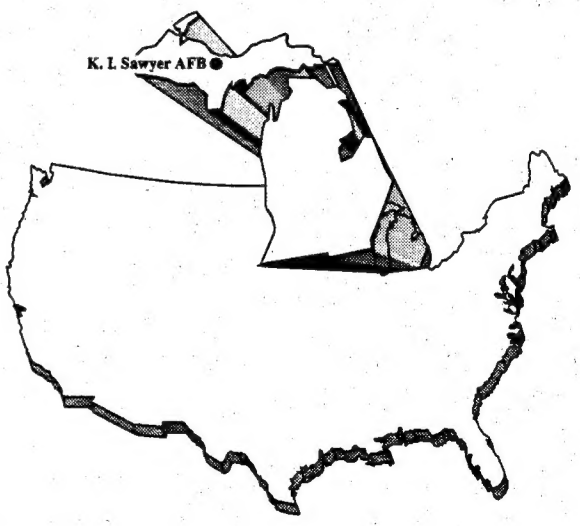


SUMMARY

SUMMARY

K. I. Sawyer Air Force Base (AFB), Michigan, was one of the bases recommended by the 1993 Defense Base Closure and Realignment Commission for closure. The Commission's recommendations were accepted by the President and submitted to Congress on July 2, 1993. As Congress did not disapprove the recommendations in the time given under the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law 101-510, Title XXIX), the recommendations have become law.

DBCRA requires the Secretary of Defense to comply with the National Environmental Policy Act (NEPA) in the implementation of the base closures and realignments. The Secretary of Defense, through the Air Force, is preparing the required NEPA documents for the base disposal. Consideration of closure is exempted under DBCRA because that decision is final under the statute. The Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan, analyzes environmental effects of the disposition of the base and its reuse under alternative redevelopment plans.

This Socioeconomic Impact Analysis Study addresses the socioeconomic effects of closure and potential reuse of the base. This document is designed to provide assistance to local governments and redevelopment agencies in the development of their reuse plan. The scope of this study includes economic activity, population, housing, public services, public finance, transportation, and utilities. This document is not required by NEPA.

Historically, the primary mission of K. I. Sawyer AFB was to provide a home for the 410th Bomb Wing. The transfer and consolidation of these Air Force activities to other Air Force bases in the United States has been initiated. The base contains an airfield; a hospital; and industrial, commercial, residential, and public facilities/recreation areas.

If the base is placed in caretaker status and not reused for other purposes, most or all of the "mothballed" facilities would be restricted from access. Security and minimal maintenance activities would be the responsibility of the Operating Location (OL) personnel and would provide only limited employment opportunities on the base. A total of 50 direct jobs would be required to maintain the premises, generating 13 secondary jobs in the region. This closure and caretaker scenario serves as the closure baseline and No-Action Alternative for this study.

A two-county area (Marquette and Delta) was initially considered the Region of Influence (ROI) for purposes of describing and analyzing the

socioeconomic effects. The ROI was then refined for each issue area as appropriate.

In the absence of any reuse of the base, population in the ROI would decrease from 112,161 in 1992 to 103,322 at closure in September 1995. Based upon population projections from NPA Data Services, Inc., the population in the ROI would increase at a rate of about 0.5 percent per year, to approximately 114,895 by 2015.

This report analyzes the socioeconomic effects of four conceptual plans involving reuse of the base by private and public entities. The plans are compared with projected post-closure conditions without reuse during the 20 years following base closure. The alternative plans are described below.

Proposed Action. Major land use components in the Proposed Action would include industrial (1,476 acres), airfield (1,397 acres), and public facilities/recreation (1,183 acres), comprising 82.5 percent of the base area. Aviation support, institutional (medical and educational), commercial, residential, and military land uses constitute the remainder of the proposed uses.

International Wayport Alternative. Major land use components in the International Wayport Alternative would include the airfield (1,055 acres), public facilities/recreation (1,118 acres), and agriculture (874 acres), and would comprise 61.9 percent of the proposed land uses. Aviation support, industrial, institutional (medical and educational), commercial, and residential land uses constitute the remainder of the proposed uses.

Commercial Aviation Alternative. Major land use components in the Commercial Aviation Alternative would include institutional (educational) (546 acres), public facilities/recreation (1,387 acres), and agriculture (1,489 acres), and would comprise 69.5 percent of the proposed land uses. Airfield, aviation support, industrial, commercial, and residential land uses constitute the remainder of the proposed uses.

Recreation Alternative. Major land use components in the Recreation Alternative would include industrial (797 acres) and public facilities/ recreation (3,986 acres), and would comprise 97.2 percent of the proposed land use. Institutional (educational), commercial, and residential land uses constitute the remainder of the proposed uses.

Closure and Reuse of Marquette County Airport. The Proposed Action, International Wayport Alternative, and Commercial Aviation Alternative call for the closure of Marquette County Airport and the relocation of its activities to K. I. Sawyer AFB. Retention of commercial aviation activities at K. I. Sawyer AFB under the above reuse alternatives would preclude the need for another commercial airport facility in the county of Marquette;

therefore, it was assumed that Marquette County Airport would close under these reuse options. For the analysis it was also assumed that Marquette County Airport operations would phase over to K. I. Sawyer AFB during the first 5 years following base closure in September 1995.

The net effects of reuse on the communities in the vicinity of K. I. Sawyer AFB would vary with the reuse alternative implemented. The net effects are the total reuse direct and secondary employment and population, decreased by the OL (No-Action Alternative) employment and population. Figures S-1 and S-2 illustrate the projected profile of changes in future employment and population within the ROI for each of the reuse alternatives and the No-Action Alternative. Key findings of this study include the following:

- Under the Proposed Action, an increase of 9,853 direct and 7,450 secondary jobs over the No-Action Alternative is projected by 2015. It is estimated that population would increase in response to these employment opportunities by 10,483 by 2015. Fiscal shortfalls due to base closure would only be reversed for Forsyth and Sands townships and the county and city of Marquette.

- The International Wayport Alternative would generate an increase of 3,844 direct and 2,528 secondary jobs over the No-Action Alternative by 2015, or approximately 36.8 percent of the employment effects of the Proposed Action. It is estimated that population would increase in response to these employment opportunities by 4,056 by 2015. Fiscal shortfalls due to base closure would only be reversed for Forsyth and Sands townships.

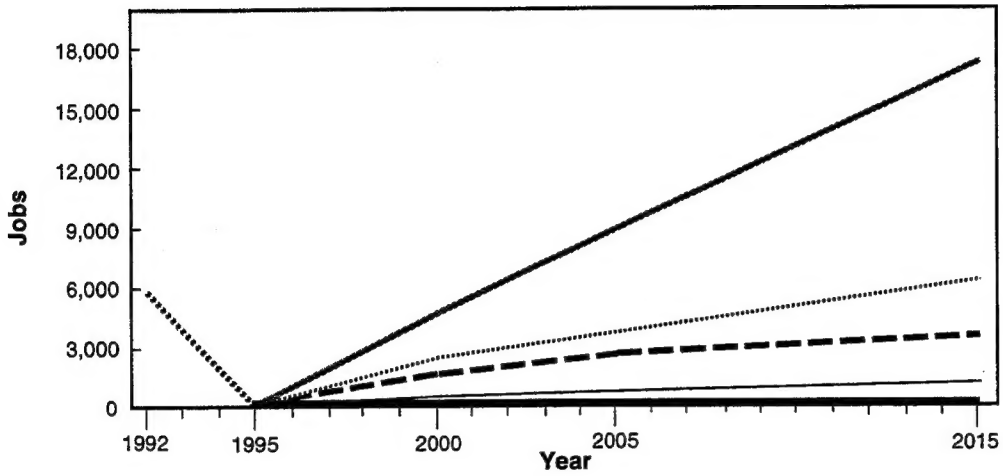
- The Commercial Aviation Alternative would generate an increase of 2,176 direct and 1,366 secondary jobs over the No-Action Alternative by 2015, approximately 20.5 percent of the employment effects of the Proposed Action. Population is projected to increase in response to these employment opportunities by 2,301 by 2015. Fiscal shortfalls due to base closure would only be reversed for Forsyth and Sands townships.

- The Recreation Alternative would generate an increase of 806 direct and 370 secondary jobs over the No-Action Alternative by 2015, or approximately 6.8 percent of the employment effects of the Proposed Action. Population is projected to increase in response to these employment opportunities by 863 by that same year. Unlike the Proposed Action, fiscal shortfalls would not be reversed for any of the jurisdictions studied.

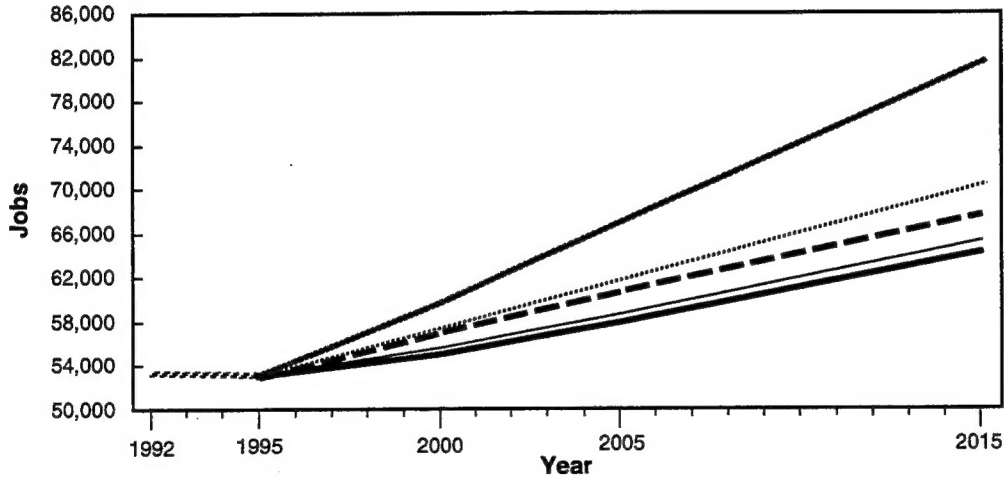
Under the No-Action Alternative, the U.S. Government would retain ownership of the Air Force fee-owned property after base closure. Non-fee-owned property would return to the owner following mutually agreed upon termination of the lease. The base would be placed in caretaker status and

ALTERNATIVE	1995 (a)	2000	2005	2015
Proposed Action	63	4,654	8,871	17,303
International Wayport Alternative	63	2,448	3,867	6,372
Commercial Aviation Alternative	63	1,738	2,743	3,542
Recreation Alternative	63	509	829	1,176

Reuse-Related Employment Effects (b)



Reuse-Related Employment Effects (b)



Total ROI Employment Including Reuse-Related Effects

EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative

(a) The 1995 values represent total base-related employment under the closure baseline.

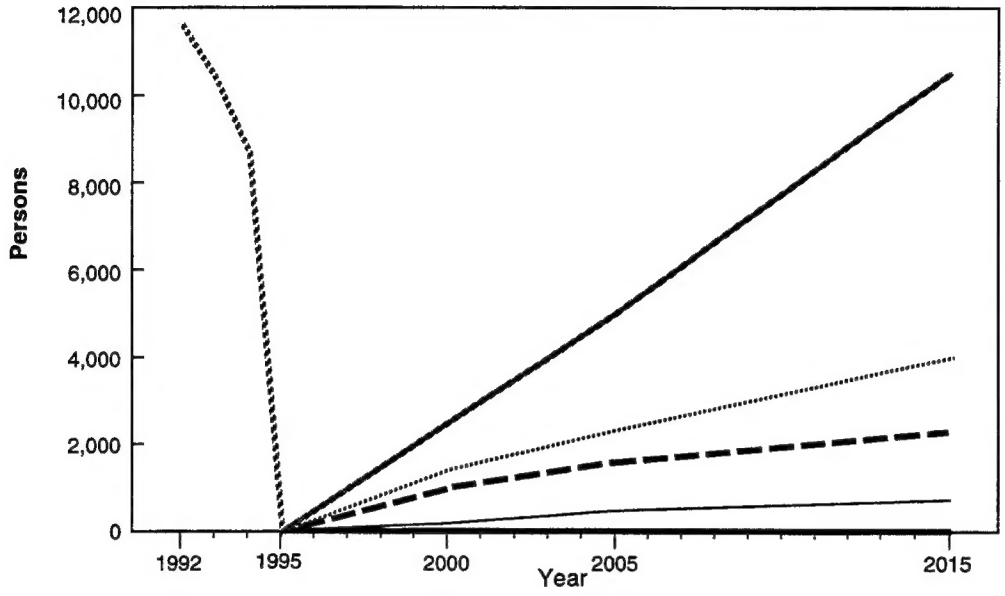
(b) Employment effects represent the change in employment relative to the No-Action Alternative.

Reuse-Related Employment Effects

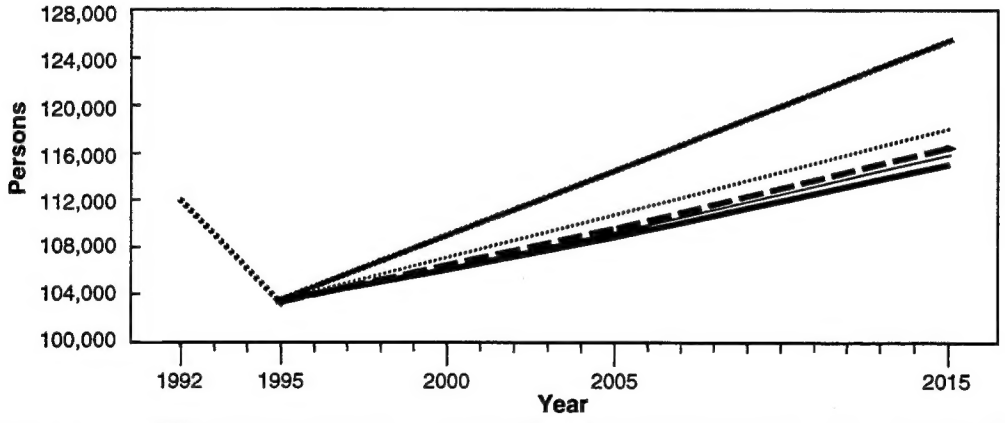
Figure S-1

ALTERNATIVE	1995 (a)	2000	2005	2015
Proposed Action	0	2,528	5,014	10,483
International Wayport Alternative	0	1,411	2,309	4,056
Commercial Aviation Alternative	0	995	1,645	2,301
Recreation Alternative	0	351	592	863

Migratory-Related Population Effects (b)



Migratory-Related Population Effects (b)



Total ROI Population Including Migratory-Related Effects

EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative

(a) 1995 represents closure conditions.
(b) Migratory (Reuse)-related population effects are the persons that would move into the ROI solely as a result of reuse.

Migratory-Related Population Effects

Figure S-2

be minimally maintained. A total of 50 direct and 13 secondary jobs would be generated by these caretaker maintenance activities to maintain Air Force fee-owned land.

Table S-1 summarizes the comparative findings of this study for each issue area and each reuse alternative after 20 years. The table also displays findings for the No-Action Alternative to provide a benchmark for assessing the effects of a particular reuse alternative relative to closure conditions.

Table S-1. Comparison of Reuse Alternatives
Page 1 of 2

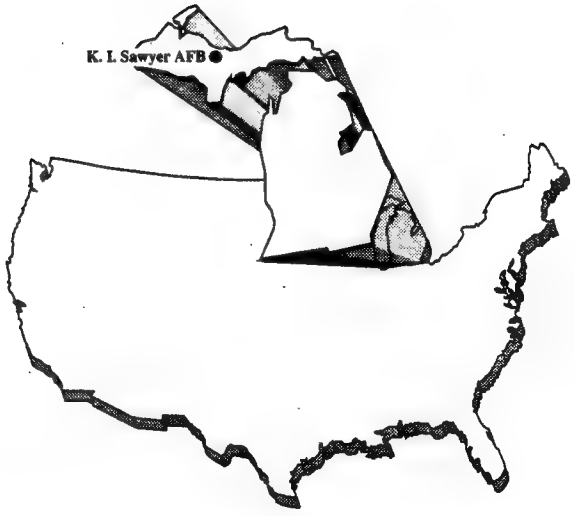
Resource	No-Action Alternative/ Caretaker Status	Change from No-Action Alternative: Proposed Action	International Wayport Alternative	Commercial Aviation Alternative	Recreation Alternative
Economic Activity[a]					
Regional Employment	63 jobs	17,303 jobs	6,372 jobs	3,542 jobs	1,176 jobs
Regional Earnings (1992$)	$1,470,059	$474,788,299	$165,583,200	$89,074,034	$24,981,820
Population	Zero effect	10,483 people	4,056 people	2,301 people	863 people
Housing	Zero demand	3,603 units	1,394 units	791 units	297 units
Public Services					
General Government, Police, and Fire					
Marquette County	Zero demand	9,233 additional persons served	3,578 additional persons served	2,031 additional persons served	764 additional persons served
Forsyth Township	Zero demand	4,205 additional persons served	1,635 additional persons served	929 additional persons served	352 additional persons served
Sands Township	Zero demand	887 additional persons served	345 additional persons served	196 additional persons served	74 additional persons served
West Branch Township	Zero demand	580 additional persons served	225 additional persons served	128 additional persons served	48 additional persons served
City of Marquette	Zero demand	1,412 additional persons served	544 additional persons served	308 additional persons served	115 additional persons served
Education					
Gwinn Area Community Schools	Zero enrollments	1,154 enrollments	449 enrollments	255 enrollments	96 enrollments
Marquette Area Public Schools	Zero enrollments	247 enrollments	95 enrollments	54 enrollments	20 enrollments

Note: (a) All effects presented in this table apply specifically to the year 2015 but may be interpreted as long-duration effects that extend indefinitely beyond 2015. Economic Activity, as shown, is based upon site-related demands. Population, Housing, Public Services, and Public Finance are based upon migratory-related demands.

Table S-1. Comparison of Reuse Alternatives
Page 2 of 2

Resource	No-Action Alternative/ Caretaker Status	Change from No-Action Alternative: Proposed Action	International Wayport Alternative	Commercial Aviation Alternative	Recreation Alternative
Health Care	K. I. Sawyer AFB hospital closed	Medical clinic open	Medical clinic open	No medical reuse	No medical reuse
Public Finance (1992$)[b]					
Marquette County	Shortfalls to $1,604,013/year	Positive; shortfalls offset by 2014	Shortfalls of $600,640 by 2015	Shortfalls of $815,512 by 2015	Shortfalls of $1,428,259 by 2015
Forsyth Township	Shortfalls to $52,587/year	Positive; shortfalls offset by 2000	Positive; shortfalls offset by 2000	Positive; shortfalls offset by 2005	Shortfalls of $37,664 by 2015
Sands Township	Shortfalls to $41,165/year	Positive; shortfalls offset by 2000	Positive; shortfalls offset by 1998	Positive; shortfalls offset by 1997	Shortfalls of $378 by 2015
West Branch Township	Shortfalls to $60,220/year	Shortfalls of $32,705 by 2015	Shortfalls of $47,621 by 2015	Shortfalls of $53,432 by 2015	Shortfalls of $58,546 by 2015
City of Marquette	Shortfalls to $59,126/year	Positive; shortfalls offset by 2010	Shortfalls of $26,505 by 2015	Shortfalls of $40,657 by 2015	Shortfalls of $52,230 by 2015
Gwinn Area Community Schools	Shortfalls to $2,565,245/year	Shortfalls of $2,565,245 by 2015	Shortfalls of $2,565,245 by 2015	Shortfalls of $2,565,245 by 2015	Shortfalls of $2,565,245 by 2015
Marquette Area Public Schools	Shortfalls to $111,264/year	Shortfalls of $111,264 by 2015	Shortfalls of $111,264 by 2015	Shortfalls of $111,264 by 2015	Shortfalls of $111,264 by 2015
Other Relevant Resources					
Transportation	No effects	LOS would decrease for eight roadway segments. All other effects are negligible.	LOS would decrease for seven roadway segments. All other effects are negligible.	LOS would decrease for six roadway segments. All other effects are negligible.	LOS would decrease for three roadway segments. All other effects are negligible.
Utilities	No effects	Increase in demand for utilities ranging from 17.90 to 122.58 percent	Increase in demand for utilities ranging from 13.42 to 47.74 percent	Increase in demand for utilities ranging from 9.21 to 33.65 percent.	Increase in demand for utilities ranging from 2.23 to 10.59 percent.

Note: (a) Projected shortfalls assume there are no offsetting changes in revenues or service delivery standards.
LOS = Level of Service



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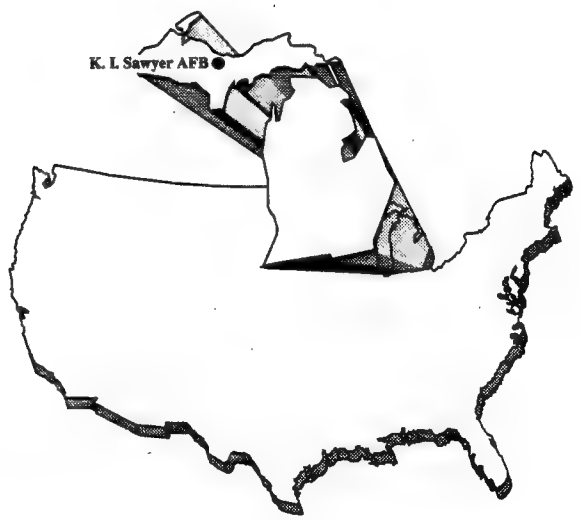


CHAPTER 1
INTRODUCTION

1.0 INTRODUCTION

Chapter 1 presents the purpose of this study, briefly discusses the reason for and nature of the closure of K. I. Sawyer Air Force Base (AFB), reviews results of previous base closures, and defines the potential reuse alternatives in terms relevant to the analysis of socioeconomic effects.

This report is organized to provide an assessment of the socioeconomic characteristics and effects of base operation; the effects of alternative site reuse scenarios on the region; and the post-closure conditions for activities related to the base property assuming the base remains in caretaker status and is not redeveloped. The remainder of the report is structured as follows:

Chapter 2 defines the Region of Influence (ROI) and provides the community setting and profile of personnel, payrolls, and activities at the base.

Chapter 3 establishes the preclosure reference and conditions for the area at base closure and assumes the base will remain in caretaker or "mothballed" status.

Chapter 4 evaluates the effects of alternative reuse plans and compares them to the post-closure conditions without reuse.

1.1 PURPOSE OF THE STUDY

The Socioeconomic Impact Analysis Study (SIAS) focuses on the socioeconomic effects resulting from the closure and potential reuse of K. I. Sawyer AFB. The scope of issues addressed includes economic activity, population, housing, and other major issues of local concern, such as public services, public finance, transportation, and utilities. These factors substantially influence the character of communities in the vicinity of the base, and are important to local residents. The analysis of these issues is intended to provide local planning officials with the necessary information with which to plan for changes at K. I. Sawyer AFB. The SIAS is not a National Environmental Policy Act (NEPA) document.

The Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan, analyzes the environmental issues associated with disposal of the base and its reuse under a range of potential redevelopment plans. The Environmental Impact Statement (EIS) was initiated to fulfill NEPA requirements that apply to federal actions, such as the decision for final disposition of K. I. Sawyer AFB. Socioeconomic factors are addressed within the EIS only from the perspective of their potential effect on the biophysical environment.

For instance, changes in economic activity, particularly in regional spending and employment, may lead to changes in area population, public service demand, and vehicular traffic on the area's road network. These effects, in turn, have the potential for beneficial or adverse environmental consequences on land use, air quality, water quality, noise, and biological and cultural resources.

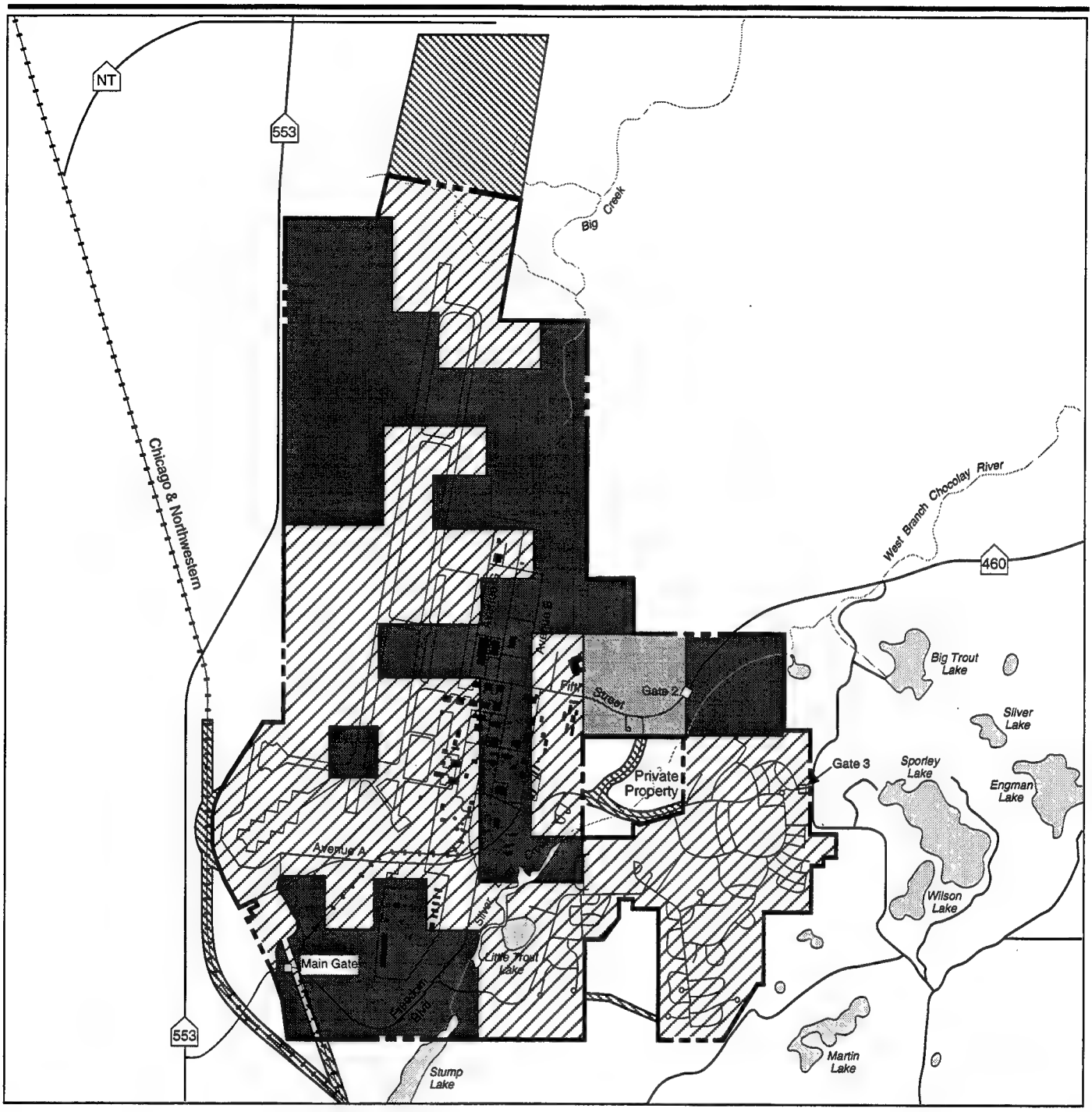
1.2 CLOSURE OF K. I. SAWYER AFB

In light of the changing international political scene and the resultant shift toward a reduction in defense spending, the Department of Defense (DOD) must realign and draw down its forces. The Department of the Air Force has been tasked under the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law [P.L.] 101-510, Title XXIX) to identify the facilities, properties, and installations that are no longer essential to support the limited force structure authorized by Congress. The Secretary of Defense then provided DOD closure and realignment recommendations to the Defense Base Closure and Realignment Commission formed as a result of the DBCRA.

The 1993 Defense Base Closure and Realignment Commission recommended a list of military bases for closure or realignment, which was accepted by the President and submitted to Congress on July 2, 1993. The recommended closure and realignment list was not disapproved by Congress within the time given under the statute to do so. Therefore, under DBCRA, the recommendations have become law. As K. I. Sawyer AFB was on the Commission's list, the decision to close the base is final. K. I. Sawyer AFB is scheduled to close in September 1995.

K. I. Sawyer AFB property falls into two categories: fee-owned and non-fee-owned. The portion of the base that is fee-owned by the Air Force comprises approximately 56 percent (2,762 acres) of the base land (Figure 1.2-1). The remaining 44 percent (2,161 acres) of base land (non-fee-owned property) controlled by the Air Force has been acquired for limited durations from numerous individuals and agencies, including the state of Michigan, county of Marquette, and the U.S. Department of the Interior. The Air Force must surrender its limited rights to this property when the land is no longer needed for military purposes and after legal obligations relating to Air Force use of the property have been satisfied.

The Air Force plans to dispose of the fee-owned property and facilities at K. I. Sawyer AFB. The disposal will be through transfer to another federal agency, public benefit conveyance to an eligible entity, negotiated sale to a public body, and/or sealed bid or auction to the general public. This disposal will be in compliance with the Surplus Property Act of 1944, the Federal Property and Administrative Services Act of 1949, and the DBCRA, which



EXPLANATION

- Owned (Fee)
- Leased
- Public Domain
- Right-of-Way/Aviation Easement
- Base Boundary

0 950 1900 3800 Feet

Air Force Real Estate Interests on K. I. Sawyer AFB

Figure 1.2-1

delegated to the Secretary of the Air Force many of the powers of the Administrator of the General Services Administration.

The closure action involves consolidation of Air Force activities and personnel transfers from K. I. Sawyer AFB to other Air Force bases in the United States, and/or a reduction in military forces through retiring weapon systems and reducing military manpower levels (U.S. Department of Defense, 1993).

The projected post-closure conditions identified for this study occur once the base has gone into "caretaker" status after the phase-down of residual operations at the base and its subsequent closure. Caretaker status includes provision of security and limited maintenance to keep base facilities in "mothballed" condition.

Analysis of this projected closure scenario, referred to as the No-Action Alternative, provides an assessment of near-term and long-term conditions in communities near the base with the base no longer in operation. This provides a benchmark for comparison of the socioeconomic consequences of the alternative reuse plans.

1.3 PREVIOUS BASE CLOSURES

Because of the potential for severing long-standing social and economic relationships, base closures can be a very disrupting experience for host communities. The future state of the local economy is always of concern, although many communities affected by base closures have successfully implemented installation reuse plans. A study completed by the President's Economic Adjustment Committee indicates that opportunities exist for successful conversion of military installations to civilian use (U.S. Department of Defense, Office of Economic Adjustment, 1990).

Included in the study was a review of the experience of nearly 100 communities that lost a local military base between 1961 and 1990. Several important findings resulting from this review are summarized below.

- Military jobs that were transferred out of the local communities numbered almost 136,800. These transfers represented permanent long-term reductions in the economic base of the communities.

- Conversion to civilian use led to a total of 158,100 direct jobs, more than replacing the 93,400 DOD civilian and contractor jobs lost due to the closings.

- Fifty-seven former bases became the seat of a number of 4-year colleges, community colleges, and post-secondary vocational-technical programs. These schools accommodate 73,200 college

students, 25,000 secondary vocational-technical students, and 62,200 trainees.

- Seventy-five former bases became host to industrial parks or plants, and 42 established municipal or general aviation airports.

The study concluded that, in the short term, closure can have substantial negative effects on the local economy. The difficult transition period generally lasts 3 to 5 years (U.S. Department of Defense, Office of Economic Adjustment, 1990).

Figure 1.3-1 provides employment statistics for 48 Air Force installation closure and reuse actions completed between 1961 and 1990. These Air Force actions resulted in the transfer of approximately 100,000 military personnel. About 28,500 on-base civilian jobs were lost in these actions. More than 70,000 civilian jobs were gained due to reuse of the sites. Considering individual installations, in most cases the number of civilian jobs in 1990 was greater than when the base was under military control. In only about 20 percent of the cases, however, does the number of new civilian jobs exceed the number of civilian and military jobs lost as a result of base closure.

1.4 REUSE OPTIONS

To help identify potential socioeconomic effects associated with the disposal of K. I. Sawyer AFB, this study addresses a range of reuse alternatives. For the purpose of conducting the required analysis, the Air Force has adopted the redevelopment plans of the K. I. Sawyer Base Conversion Authority as the Proposed Action. This organization was given authority in September 1993 by the state of Michigan to redevelop K. I. Sawyer AFB. There are a total of 11 committee members: 7 represent the interests of business, residents, labor, and utility services from Alger, Delta, Dickinson, Marquette, and Menominee counties; 1 each of the remaining 4 is from the Marquette County Board of Commissioners and the 3 townships of Sands, Forsyth, and West Branch. The organization assessed land, facilities, and infrastructure on K. I. Sawyer AFB and evaluated their potential for airport and non-aviation uses in the Base Reuse Plan, K. I. Sawyer AFB and Community, Gwinn/Marquette Michigan (Greiner, Inc., 1995).

To address the range of potential effects of disposal and reuse, the Air Force developed four reuse alternatives, in addition to a No-Action Alternative that involves no reuse. Actual decisions on reuse of the property will be made by its recipients subsequent to disposal. The Proposed Action, which supports a civilian airport, is discussed in Section 1.4.1; the International Wayport Alternative, which centers on a multi-purpose airport, is discussed in Section 1.4.2; the Commercial Aviation Alternative, which encompasses a regional commercial airport, is discussed in Section 1.4.3; the Recreation

REGION	No. of Bases Closed	Military Jobs Transferred	Civilian Jobs Lost	New Civilian Jobs on Base
1. New England	5	11,241	921	9,947
2. Mid East	3	4,064	11,085	4,298
3. Great Lakes	6	7,595	2,453	10,380
4. Plains	7	18,502	3,129	9,530
5. Southeast	10	22,103	3,349	20,252
6. Southwest	9	24,472	6,058	10,942
7. Rocky Mountain*	3	3,663	336	307
8. Far West	5	8,539	1,093	4,421
Total	48	100,179	28,424	70,077

* Data for one AFB not available.
Source: U.S. Department of Defense, Office of Economic Adjustment, 1990.

Summary of Air Force Installation Closure and Reuse Actions Completed between 1961 and 1990

Figure 1.3-1

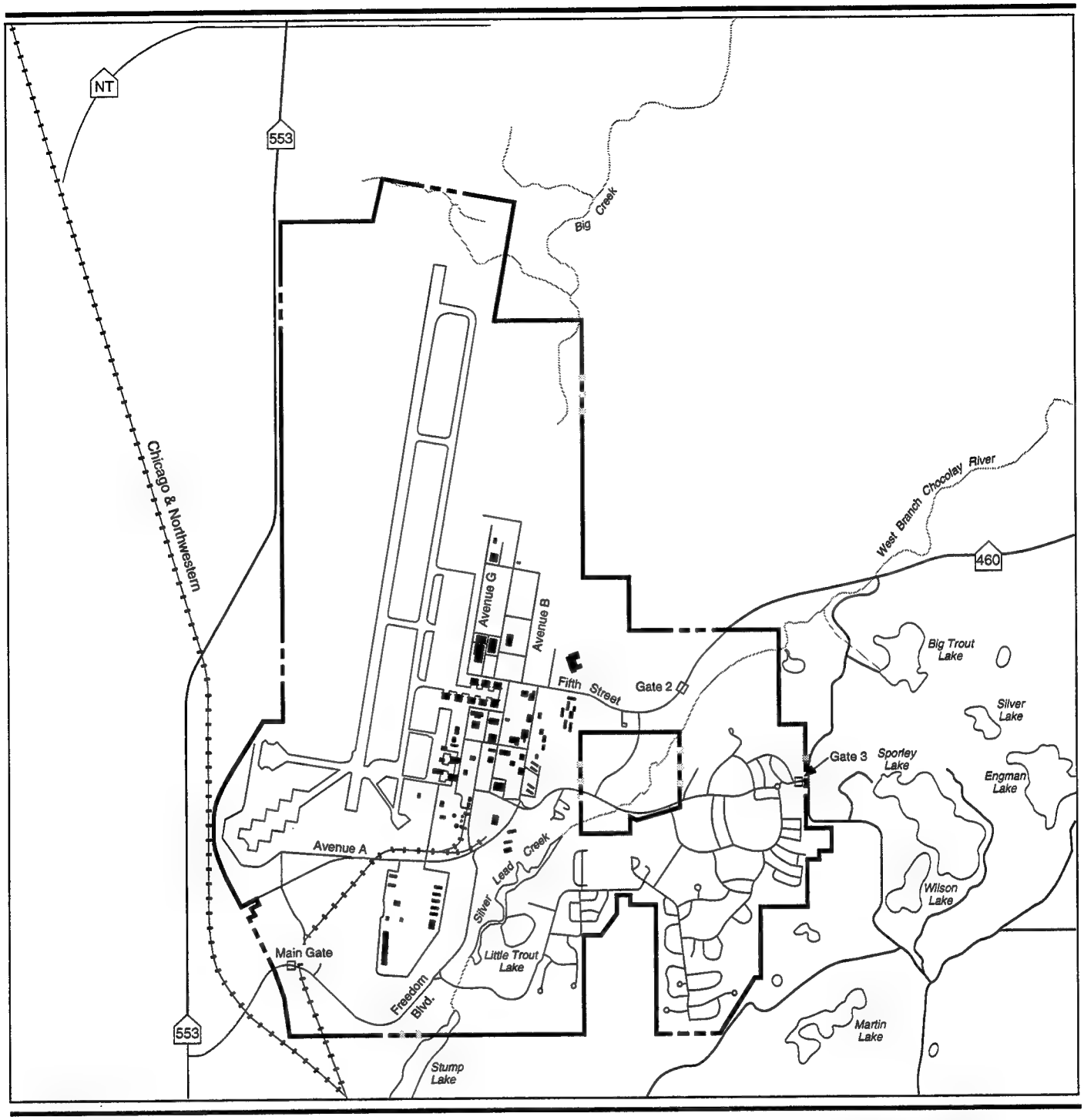
Alternative, which features extensive public facilities/recreation, is discussed in Section 1.4.4; the No-Action Alternative, which represents post-closure conditions, is discussed in Section 1.4.5; and Section 1.4.6 discusses Other Land Use Concepts.

Under all alternatives, an Air Force Base Conversion Agency (AFBCA) Operating Location (OL) has been established at K. I. Sawyer AFB. The responsibilities of the OL include coordinating post-closure activities with the active force, establishing a caretaker force to maintain Air Force-controlled properties after closure, and serving as the Air Force local liaison to community reuse groups until lease termination, title surrender, or disposal (as appropriate) of the Air Force-controlled property has been completed. For the purposes of environmental analysis, it was assumed that this team consists of 50 people, composed of Air Force employees and non-federal supporting personnel.

Table 1.4-1 lists the proposed reuse activities by land use and the proposed acreage of each use (reported acreages throughout this document are approximate). Air Force property comprising these 4,923 acres will be referred to as on-base property. All other public and private property in the region is discussed as off-base property. A privately owned parcel of approximately 143 acres is within the outer boundary at K. I. Sawyer AFB (Figure 1.4-1). Because this property is outside the control of the Air Force, it is not included within the reuse plans.

Table 1.4-1. Land Use Acreage by Alternative

Land Use	Proposed Action	International Wayport Alternative	Commercial Aviation Alternative	Recreation Alternative
Airfield	1,397	1,055	510	0
Aviation Support	455	617	325	0
Industrial	1,476	495	494	797
Institutional				
Medical	16	24	0	0
Educational	8	138	546	67
Commercial	43	64	25	13
Residential	152	538	147	60
Public Facilities/ Recreation	1,183	1,118	1,387	3,986
Agriculture	0	874	1,489	0
Military	193	0	0	0
Total	4,923	4,923	4,923	4,923



EXPLANATION

Base Boundary

K.I. Sawyer AFB Property

0 950 1900 3800 Feet

Figure 1.4-1

1.4.1 Proposed Action

The land uses presented in the Proposed Action (Figure 1.4-2) provide a framework for development of a comprehensive reuse plan based on a civilian airport with air cargo, aircraft maintenance, general aviation, and regional air carrier service. Non-aviation areas would include industrial, institutional (medical and educational), commercial, residential, and public/facilities recreation uses. A small military component would include the U.S. Army Reserve and the Michigan Army National Guard (MANG).

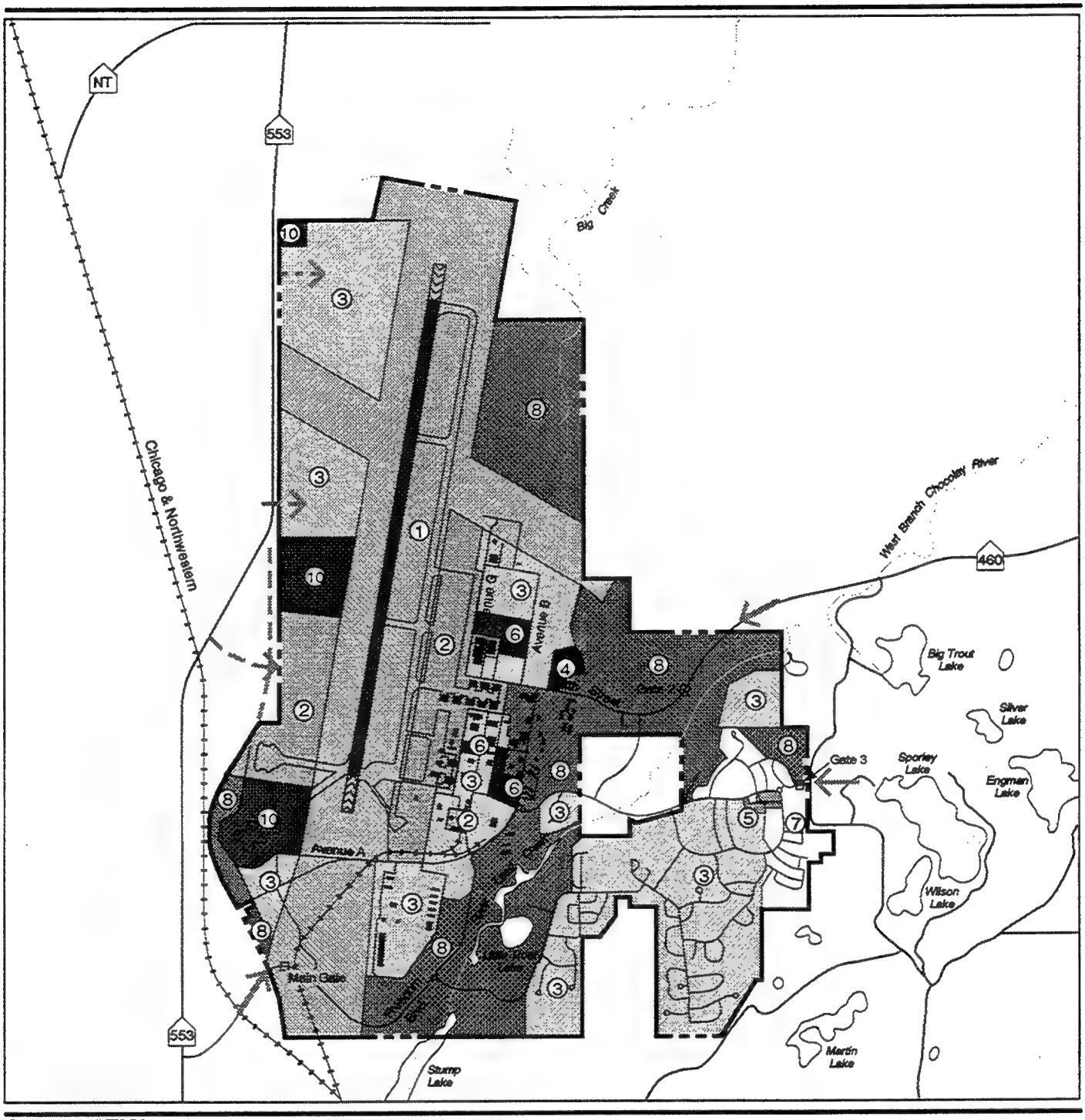
Airfield. The airfield comprises 1,397 acres, or 28 percent of the base area, and would include the 12,300-foot by 200-foot runway, taxiways, and runway protection zones (RPZs). The RPZs are areas at the ends of the runway that are kept free of development, except for navigational aids, for added safety during aircraft arrivals and departures. The operational apron is adequate for use by the projected aircraft. Within the airfield land use, an area has been included for the addition of a crosswind runway. Construction of the crosswind runway could occur between 2015 and 2020.

The airport area in this layout includes aviation and non-aviation land uses that may generate revenue for financial support of the airport. The following major improvements to the airfield would occur:

- Provision for crash, fire, and rescue facilities
- Construction of a new passenger terminal on the west side of the main runway north of the alert aprons
- Modification of the lighting system and approach aids
- Retention of very-high frequency omnidirectional range (VOR) facilities.

Additional airport improvements would meet Federal Aviation Administration (FAA) requirements. The airfield and aviation support areas would likely be conveyed to an airport authority, which would manage the development and operation of the airfield in accordance with the FAA and state regulations. The underground aircraft hydrant fueling system would be abandoned in place or removed.

Based on historic weather and wind patterns, up to 70 percent of the projected aircraft operations (an operation is defined as an aircraft landing or takeoff) would use Runway 01, while the remaining 30 percent would use Runway 19. Projected annual aircraft operations would include general aviation, regional commercial passenger, air cargo, and maintenance. Projected transient aircraft operations are assumed to be in support of these



Proposed Action

Figure 1.4-2

four major aviation user groups and are included in the operations projections totals. It was assumed that a small amount of military aircraft, mostly Canadian, would continue to use the airfield as a fueling point between the east and west coasts. A full-service Fixed Base Operator (FBO) would be established at the airport to provide general aviation functions and services.

Aviation Support. The aviation support area encompasses 455 acres, or 9 percent of the base property, and consists of three parcels. The first parcel, east of the runway, includes the Air Traffic Control (ATC) tower, the flight simulator, an eight-bay fire station, aircraft maintenance hangars, and storage buildings. The ATC tower operation would continue with operation and maintenance being provided by the K. I. Sawyer Base Conversion Authority. The second parcel, southeast of the runway, includes the aircraft fuel storage area.

The third parcel, west of the southern end of the airfield, includes the north alert apron and adjacent vacant land. Reuse of this parcel would include a new 25,500-square-foot commercial passenger terminal, which would be constructed north of the alert apron. A new access road and 188,000 square feet of parking would also be constructed for the new terminal. As part of the reuse of the base, the K. I. Sawyer Base Conversion Authority has accepted a proposal for use of portions of the base by a local Native American organization within the aviation support land use. This group would utilize Buildings 400, 421, and 422 for light industrial use. The aviation support facilities could be 70 percent utilized by 2015.

Industrial. The industrial area is 1,476 acres, or 30 percent of the base property, and includes eight parcels. Three parcels located west of the airfield would be used for light industrial with supporting commercial activities. Two parcels east of the airfield, including the Weapons Storage Area, would also be used for light industrial and commercial activities. Three parcels in the east and southeast portions of the base would be used for industrial development. The housing units would be demolished to allow for this reuse. All industrial development could begin in 1995 and could be 70 percent complete by 2015.

Institutional. The institutional land use encompasses 24 acres, or 1 percent of the base property, and includes medical and educational uses located in two parcels. The medical land use includes the base hospital, which could be reused as a medical clinic within the first 5 years after closure.

The educational parcel includes the Jack and Jill Center, Youth Center, and Child Development Center, which would continue with the same uses. The educational land use could be 100 percent complete by 2000.

Commercial. Commercial uses comprise 43 acres, or 1 percent of the base, in three parcels east of the airfield. The northernmost parcel includes the Accounting and Finance and four other administrative buildings. The center parcel includes three small buildings. The southern parcel includes base engineering, Schedule Airlines Ticket Office, education center, personnel office building, and Wing Headquarters. Reuse would include office and back office uses. Commercial development could be 100 percent complete by 2015.

Residential. Residential areas cover 152 acres, or 3 percent of the base, in one parcel. This parcel, adjacent to Gate 3, includes 422 housing units, the preschool, and a shoppette that would be utilized by a local Native American organization. These residential units are projected to be 100 percent occupied by 2015.

Public Facilities/Recreation. The public facilities/recreation area includes 1,183 acres, or 24 percent of the base property. The golf course, community recreation areas near Little Trout Lake, ball fields, and indoor facilities, such as the bowling center, gymnasium, and swimming pool, would be retained for public use. In addition, the small arms firing range in the southern portion of the base would continue to be used for small arms training. No demolition or new construction is proposed for the recreation area. Public facilities/recreation reuse could commence immediately after base reuse is initiated.

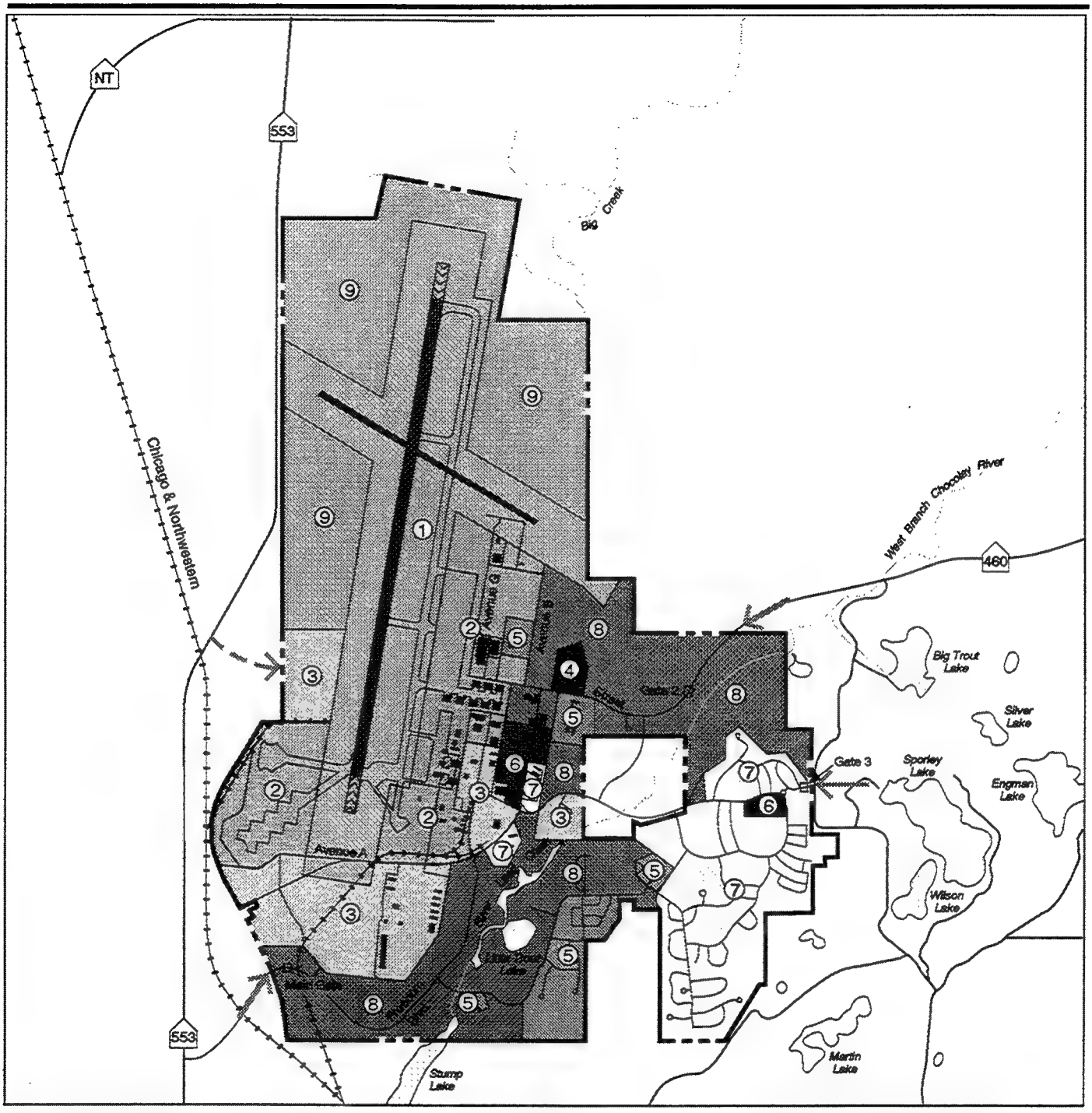
Military. Military land use would occupy 193 acres, or 4 percent of the base, in two parcels west of the airfield. These parcels would be used by the U.S. Army Reserve and the MANG for operations, training, and storage of equipment. Reuse could commence immediately after base closure.

1.4.2 International Wayport Alternative

The International Wayport Alternative (Figure 1.4-3) proposes a multi-purpose airport with international and regional aircraft maintenance, commercial passenger, air cargo, and general aviation services. Non-aviation uses would consist of industrial, institutional (medical and educational), commercial, residential, public facilities/recreation, and agricultural. The total acreage for each land use category is shown in Table 1.4-1.

Airfield. The airfield comprises 1,055 acres, or 21 percent of the base area, and would contain a 12,300-foot by 200-foot runway, taxiways, a new crosswind runway and taxiway, and RPZs. The crosswind runway would be constructed after 2005. The operational apron is adequate for use by projected aircraft.

The international wayport concept is based on several well positioned international airports being developed in rural, unpopulated areas of North



EXPLANATION

- ① Airfield
- ② Aviation Support
- ③ Industrial
- ④ Institutional (Medical)
- ⑤ Institutional (Educational)
- ⑥ Commercial
- ⑦ Residential
- ⑧ Public Facilities/ Recreation
- ⑨ Agriculture
- Base Boundary

0 950 1900 3800 Feet

International Wayport Alternative

Figure 1.4-3

America that have major sections of unused airspace. The proposed International Wayport Alternative would provide an international transfer point for both scheduled passenger and air cargo flights from major cities in eastern Europe and Asia.

The airport layout characteristics related to large international aircraft operations (e.g., runway/taxiway dimensions, separations, clearances) were developed using the FAA Airport Design Advisory Circular 150/5300-13. The airport area in this layout includes aviation and non-aviation land uses that may generate revenue for financial support of the airport. The following major improvements to the airfield would occur:

- Construction of a 6,500- by 100-foot crosswind runway and associated taxiway
- Construction of a new passenger terminal on the west side of the main runway north of the alert aprons
- Installation of Category III Precision Instrument Landing System (ILS) and Precision Approach Path Indicators (PAPIs) on Runway 01/19
- Retention or replacement of the Radar Approach Control (RAPCON) facility and installation of an automated international weather observation station.

Additional airport improvements would be made to meet FAA requirements. The airfield and aviation support areas would likely be conveyed to an airport authority, which would manage the development and operation of the airfield in accordance with the FAA and state regulations. The underground aircraft hydrant fueling system would be abandoned in place or removed.

Based on historic weather and wind patterns, up to 70 percent of the projected aircraft operations would use Runway 01, while the remaining 30 percent would use Runway 19. Aircraft operations on the crosswind runway would be 30 percent on Runway 12 and 70 percent on Runway 30. Projected annual aircraft operations include general aviation, commercial passenger, air cargo, and maintenance. Projected transient aircraft operations are assumed to be in support of these four major aviation user groups and are included in the operations projections totals. It was assumed that a small number of military aircraft, mostly Canadian, would continue to use the airfield as a fueling point between the east and west coasts. A full-service FBO would be established at the airport to provide general aviation functions and services.

Aviation Support. The aviation support area encompasses 617 acres, or 13 percent of the base property, and consists of two parcels. The first parcel is located east of the runway. This parcel includes the ATC tower, aircraft

fuel storage area, flight simulator, eight-bay fire station, aircraft maintenance hangars, and storage buildings.

Aircraft maintenance operations and air cargo handling would be located in the B-52 aircraft maintenance complex in the central portion of the aprons east of the main runway. This area includes eight large aircraft maintenance hangars and six associated aircraft parts and equipment storage buildings. Aviation-compatible manufacturing uses may also be located within this parcel. The base operations building and an apron east of the runway would be utilized by the aircraft fueling contractor and the airfield maintenance staff.

The second parcel, west of the southern end of the airfield, includes the alert aprons. Reuse of this parcel would include a new 65,000-square-foot commercial passenger terminal, which would be constructed in the vicinity of the alert aprons. A new access road and parking lot would be constructed to support the proposed passenger terminal. The southern alert apron could be used to park aircraft such as cargo carriers. The aviation support facilities could be approximately 40 percent utilized by 2015.

Industrial. The proposed industrial area is approximately 495 acres, or 10 percent of the base property, and includes four parcels. One parcel surrounds the southern portion of the airfield and contains the Weapons Storage Area. The second parcel includes the maintenance and storage buildings southeast of the main runway. The third industrial parcel includes the wastewater treatment plant (WWTP) in the southeastern portion of the base. The fourth industrial parcel, west of the airfield runway, does not include any buildings. These industrial parcels would be utilized for diversified industrial use, such as manufacturing and warehousing. Industrial development could begin in 1995 and would be approximately 70 percent complete by 2015.

Institutional. The institutional land use is approximately 162 acres, or 3 percent of the base property, and includes both medical and educational land uses distributed throughout the southeastern quadrant of the base.

The medical land use includes the base hospital, which would be reused as a medical clinic within the first 5 years after closure.

The educational land use includes five separate parcels, which would be used for vocational/technical training and support, and public educational purposes for approximately 500 students. The first parcel, west of the hospital, includes the communications facility and an administrative building for vocational classroom and administrative functions. The second parcel, immediately south of the hospital, includes a dormitory complex that would be used to house up to 375 students. The third parcel includes 198 housing units and would be utilized for married students and instructor housing. A

fourth parcel includes the small arms firing range, which would be used for security and public safety training. The fifth parcel includes the K. I. Sawyer AFB Elementary School, which would continue to be utilized by the Gwinn Area Community Schools for public educational purposes. The educational reuse could be 100 percent complete by 2000.

Commercial. Commercial uses comprise 64 acres, or 1 percent of the base, in two parcels. The first parcel is in the central portion of the base and includes the Commissary, Base Exchange, theater, and library. Reuse would include neighborhood commercial development and office or other uses such as telecommunications, casino gaming, or a conference center. The second parcel, in the residential area, would include the service station, child care center, youth center, and chapel. These uses would continue during reuse. Commercial development could be 100 percent complete by 2015.

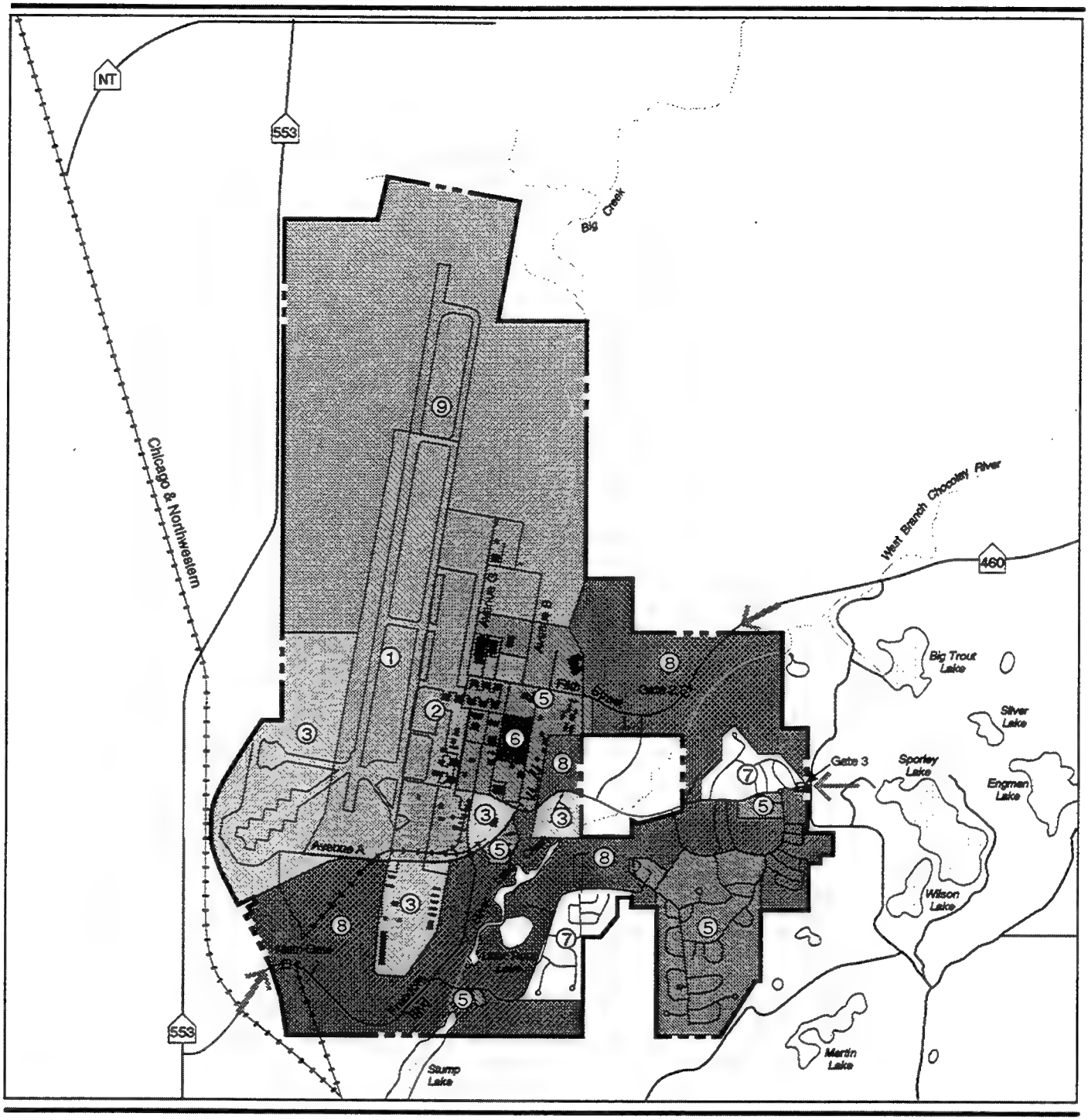
Residential. Residential areas cover 538 acres, or 11 percent of the base, in three parcels. Two parcels are in the central portion of the base and include the Visiting Officers' Quarters (VOQ) and Visiting Airmen's Quarters (VAQ), which would continue to be used for residential uses to house up to 385 people. These units would be 100 percent occupied by 2000. The other parcel includes 1,471 housing units, which would be utilized for permanent residential housing. These residential units are projected to be 100 percent occupied by 2015.

Public Facilities/Recreation. The public facilities/recreation area includes 1,118 acres, or 23 percent of the base property. The golf course, community recreation areas near Little Trout Lake, ball fields, and indoor facilities, such as the bowling center, gymnasium, and swimming pool, would be retained for public use. The Silver Lead Creek riparian area would be used for recreational purposes. No demolition or new construction is proposed for the recreation areas. Public facilities/recreation reuse could commence immediately after base closure.

Agriculture. Agricultural land occupies 874 acres, or 18 percent of the base, surrounding the northern section of the airfield. The area would be used for timber production, which would commence immediately after base closure. It is anticipated that timber production may occur at least once within the 20-year analysis period.

1.4.3 Commercial Aviation Alternative

The Commercial Aviation Alternative (Figure 1.4-4) proposes a regional commercial airport with a vocational/educational training facility. Areas are proposed for airfield, aviation support, industrial, institutional (educational), commercial, residential, public facilities/recreation, and agricultural uses. The total acreage for each land use category is shown in Table 1.4-1.



EXPLANATION

- ① Airfield
- ② Aviation Support
- ③ Industrial
- ④ Institutional (Medical) *
- ⑤ Institutional (Educational)
- ⑥ Commercial
- ⑦ Residential
- ⑧ Public Facilities/ Recreation
- ⑨ Agriculture
- Base Boundary
- Access Point
- Runway

0 950 1900 3800 Feet

* Standard land use designation not applicable to this figure.

Commercial Aviation Alternative

Figure 1.4-4

Airfield. The airfield comprises 510 acres, or 10 percent of the base area, and would contain the southern portion of the 12,300-foot by 300-foot runway, taxiways, and RPZs. The operational apron is adequate for use by the projected aircraft.

The airport layout characteristics related to commercial and general aviation aircraft operations (e.g., runway/taxiway dimensions, separations, clearances) were developed using the FAA Airport Design Advisory Circular 150/5300-13. The airport area in this layout includes aviation and aviation support land uses that may generate revenue for financial support of the airport. The following major improvements to the airfield would occur:

- Designation of a 6,500- by 100-foot southern section of the runway as a visual flight rule (VFR) runway
- Painting and marking of the runway pavement to conform to aviation marking standards
- Construction of a new passenger terminal on the east side of the north apron
- Installation of Category I Precision ILS and PAPIs on Runway 01/19. Retention of the VOR facility
- Retention or replacement of the RAPCON facility and installation of an automated international weather observation station.

Additional airport improvements would be made to meet FAA requirements. The airfield and aviation support areas would likely be conveyed to an airport authority, which would manage the development and operation of the airfield in accordance with the FAA and state regulations. The underground aircraft hydrant refueling system would be abandoned in place or removed.

Based on historic weather and wind patterns, up to 70 percent of the projected aircraft operations would use Runway 01, while the remaining 30 percent would use Runway 19. Projected annual aircraft operations include commercial passenger and general aviation. Projected transient aircraft operations are assumed to be in support of these two major aviation user groups and are included in the operations projections totals. A full-service FBO would be established at the airport to provide general aviation functions and services.

Aviation Support. The aviation support area encompasses 325 acres, or 7 percent of the base property, and consists of one parcel located east of the runway. This parcel includes the ATC tower, aircraft fuel storage area, flight simulator, eight-bay fire station, some aircraft maintenance hangars, and storage buildings.

Aircraft maintenance facilities would be located in the west end of the B-52 aircraft maintenance complex in the central portion of the aprons east of the main runway. This area includes two of the eight large aircraft maintenance hangars and associated aircraft parts and equipment storage buildings. The base operations building and associated apron east of the runway would be utilized by the aircraft fueling contractor and the airfield maintenance staff. A new 40,000-square-foot commercial passenger terminal would be constructed east of and adjacent to the northern apron. The aviation support facilities could be approximately 100 percent utilized by 2015.

Industrial. The industrial area covers 494 acres, or 10 percent of the base property, in four parcels. The first parcel, located west of the runway, contains the alert aprons. The second parcel includes Weapons Storage Area and storage buildings. Anticipated industrial uses include warehousing, storage, and manufacturing activities. The third and fourth parcels include the WWTP and heating plant. Industrial development could begin in 1995 and could be approximately 55 percent complete by 2015.

Institutional. The institutional (educational) land use covering 546 acres, or 11 percent of the base, is divided into five parcels. The first two parcels, in the central portion of the base, contain the VAQ, VOQ, two dormitory complexes, a flight simulator, storage facilities, and the education center buildings. These parcels would be developed for an institutional vocational/ technical training center for approximately 1,500 students. The types of training activities could include search and rescue, heat and sewage plant operations, golf course management, forestry management, child care, hospital aid, and mining skills. The two dormitory complexes would house up to 760 students. The third parcel in the southeast portion of the base, consisting of 653 housing units, would be utilized by married students and instructors. The fourth parcel, southwest of Gate 3, would use the youth center, the child care center, and the chapel. The fifth parcel, in the southern portion of the base, includes the small arms firing range. The range would be used for public safety training. No new construction is planned and educational reuse could be complete by 2015.

Commercial. The area proposed for commercial reuse covers 25 acres, or less than 1 percent of the base acreage, in the central portion of the base. The Base Exchange and Commissary would be reused for neighborhood retail with other facilities used for office space. Commercial development could begin soon after closure and could be 40 percent complete by 2015.

Residential. The residential land use encompasses 147 acres, or 3 percent of the base, within two parcels. The first parcel is east of Little Trout Lake and includes 198 housing units that would be reused for permanent residences. The second parcel is south of the golf course and includes 192 units that would be renovated for seasonal resort housing. Development

would be initiated immediately after closure and could be 100 percent complete by 2015.

Public Facilities/Recreation. The proposed public facilities/recreation area consists of 1,387 acres, or 28 percent of the base property. This area is northeast and southwest of the airfield. The reuse for this area would be similar to that described in the Proposed Action. The residential units within this land use would be demolished after closure. The Silver Lead Creek riparian area would be used for recreational purposes.

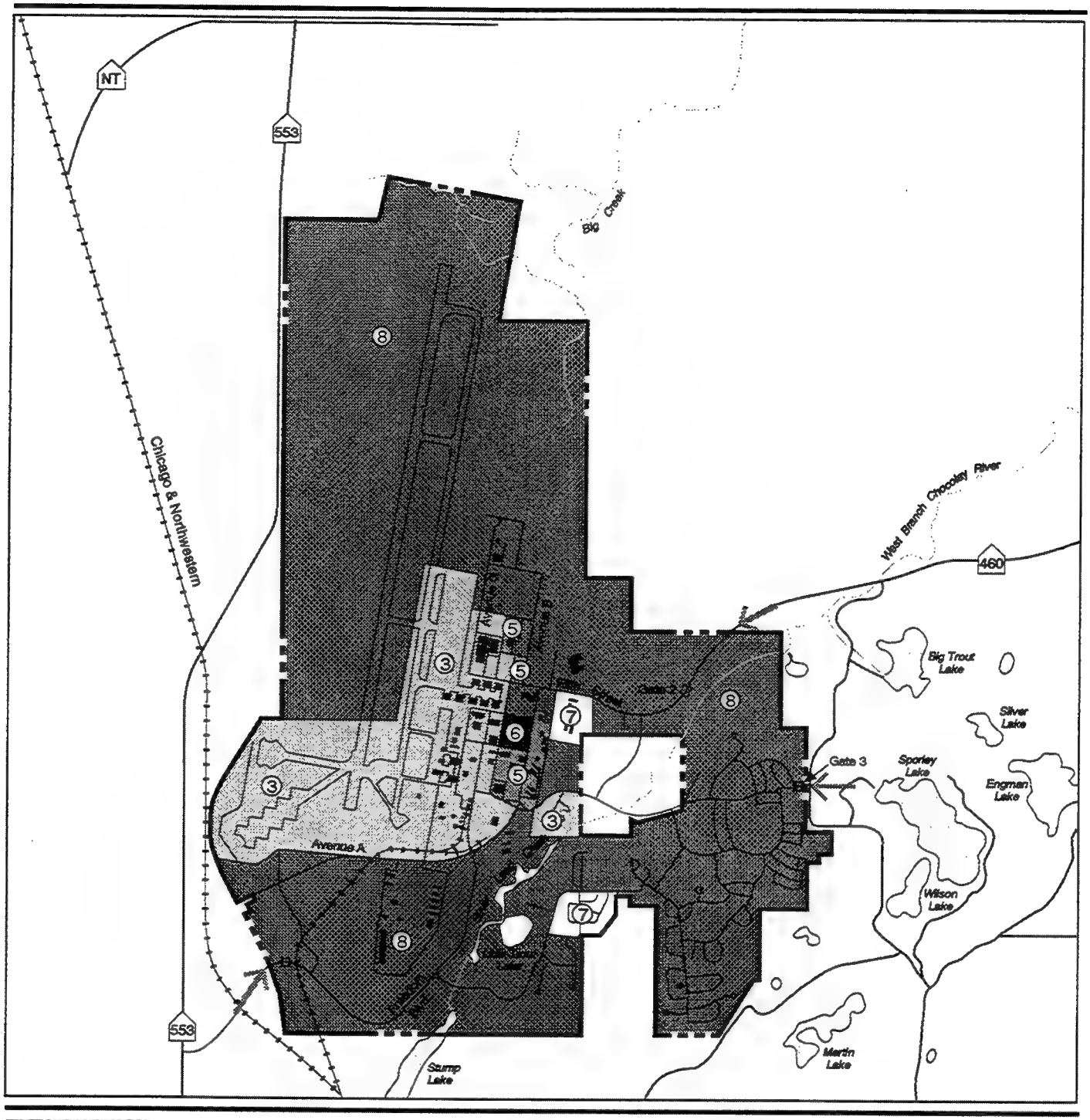
Agriculture. The agricultural land, which is in the northern half of K. I. Sawyer AFB, covers 1,489 acres, or 30 percent of the base. This area would be utilized for timber production, which would commence immediately after closure. It is anticipated that timber production may occur at least once within the 20-year analysis period.

1.4.4 Recreation Alternative

The focus of the Recreation Alternative (Figure 1.4-5) is restoration and conservation of natural resources for a regional multi-use recreation area. A majority of the base would therefore be utilized for public facilities/recreation activities. The remaining portions of base property would be developed for industrial, institutional (educational), commercial, and residential uses. The total acreage for each land use category is shown in Table 1.4-1.

Industrial. The proposed industrial land use area covers 797 acres, or about 16 percent of the base property, in two parcels. The first parcel is along the eastern and southern portion of the airfield and includes the alert apron, fire stations, maintenance, and storage facilities. Industrial uses would include light industrial, manufacturing, storage, and warehousing. Under this reuse, the heating plant would be converted to an electric generating facility. Adjacent to Silver Lead Creek, the second parcel contains the WWTP, which, along with the heating plant, would be reused within the first 5 years after closure. The other industrial use areas would be 5 percent utilized by 2015.

Institutional. The institutional (educational) land use area covers 67 acres, or 1 percent of the base property, in two parcels. The first parcel, west of Avenue B, contains a communications building and a security building. The facilities, which could accommodate approximately 250 students, would be used for research and training for the timber or mining industry. A parcel south of the first parcel includes a dormitory complex, the chapel, and the recreation center. The reuses for these facilities would remain the same in support of the training activities. Institutional reuse would be approximately 80 percent complete by 2015.



EXPLANATION

- ① Airfield *
- ② Aviation Support *
- ③ Industrial
- ④ Institutional (Medical) *
- ⑤ Institutional (Educational)
- ⑥ Commercial
- ⑦ Residential
- ⑧ Public Facilities/ Recreation
- ⑨ Agriculture *
- Base Boundary
- Access Point

0 950 1900 3800 Feet

* Standard land use designation not applicable to this figure.

Recreation Alternative

Figure 1.4-5

Commercial. The commercial area includes 13 acres, or less than 1 percent of the area, in the central portion of the base. This area includes the Commissary, Base Exchange, and other retail facilities, which would be developed for neighborhood retail and office uses. Commercial uses could include back offices, such as telecommunications or order processing divisions of financial companies, and casino gaming. Development would be approximately 75 percent complete by 2015.

Residential. The residential reuse area encompasses 60 acres, or 1 percent of the area, and includes two parcels. The first parcel is southwest of the golf course and consists of a dormitory complex that could house approximately 375 people and would be reused for visitor lodging. The second parcel, east of Little Trout Lake, contains 112 units that would be used for seasonal housing. The residential units would be 100 percent occupied by 2015.

Public Facilities/Recreation. The public facilities/recreation area contains most of the undeveloped regions of the base, and includes most of the airfield. This area, covering 3,986 acres, or about 81 percent of the base property, would be used for regional recreational activities with emphasis on winter sports, such as cross-country skiing and snowmobiling. The Silver Lead Creek riparian area would be set aside for natural resource conservation. The golf course would be retained and utilized for cross-country skiing in the winter. The hospital would be reused as an interpretive center, cultural center, or museum, and could include space for small conferences or retreats. The two mobile home parks would be converted to publicly administered seasonal recreation vehicle use. The housing units within the public facilities/recreation area would be demolished, with reuse of all other facilities within this land use occurring within 10 years after closure.

1.4.5 No-Action Alternative

The No-Action Alternative would result in the federal government retaining ownership of the Air Force fee-owned property after closure. Non-fee-owned property would return to the lessee upon mutually agreed termination of the lease. The base property would not be put to further use, but would be preserved (i.e., placed in a condition intended to limit deterioration and ensure public safety). All base property would be placed in caretaker status. The Air Force would be responsible for caretaker activities on Air force fee-owned land; it is assumed that the property owners would also maintain their property in caretaker status. Caretaker activities would consist of base resource protection, grounds maintenance, operation of utilities as necessary, and building care. No other military activities or missions are anticipated to be performed on the property.

The future levels of maintenance include:

- Maintaining structures to limit deterioration
- Isolating or deactivate utility distribution lines on base
- Providing limited maintenance of roads to ensure access
- Providing limited grounds maintenance of open areas to eliminate fire, health, and safety hazards.

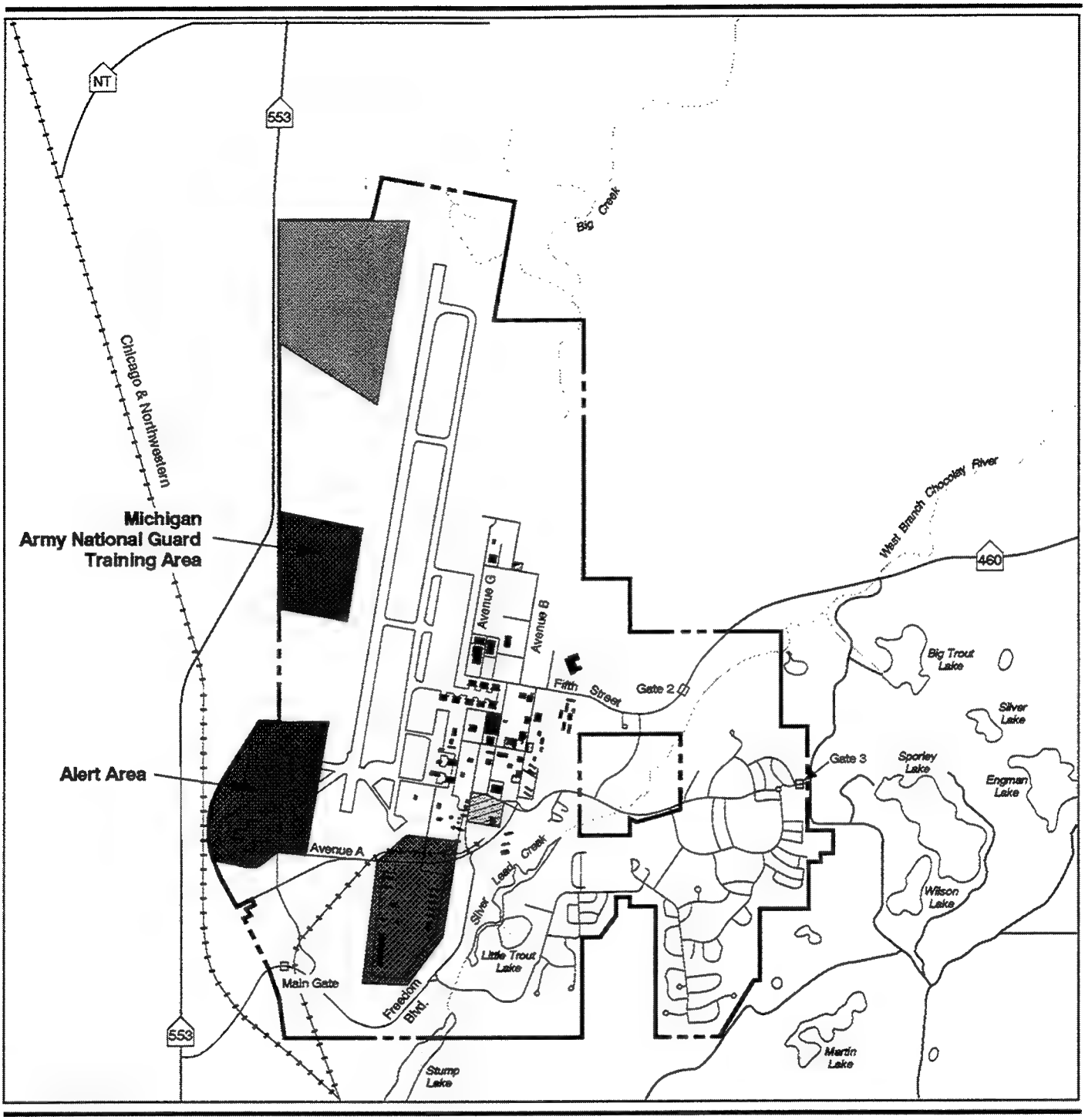
1.4.6 Other Land Use Concepts

This section describes proposed federal property transfer and conveyances to non-federal agencies and private parties. These property transfers and conveyances, with the exception of the Proposed Action, are not part of any integrated reuse option. They are independent of one another and could be implemented individually or in combination with a modified reuse alternative.

In compliance with the Federal Property and Administrative Services Act of 1949, the Air Force solicited proposals from other federal agencies regarding their interest in acquiring any lands or facilities identified for disposal at K. I. Sawyer AFB.

To date, four formal proposals for federal conveyance or other land use concepts have been identified for K. I. Sawyer AFB. These include the Michigan Army National Guard (MANG), a sawmill, a Waste to Energy/Recycling facility, and a Waste to Energy/Environmental Services facility (Figure 1.4-6). In addition to the formal proposals, interest by the public was expressed for a potential correctional facility (prison). The MANG has been incorporated into the Proposed Action.

Michigan Army National Guard. The MANG has expressed interest in utilizing portions of the base property as a headquarters for the 107th Combat Engineering Battalion of the Upper Peninsula, which currently includes 900 Guard members. Activities would involve an average of 30 weekend drills per year, each consisting of approximately 150 people. The MANG would utilize the vehicle maintenance shop (Building 608), which has 20 bays and a paint booth, for vehicle and equipment maintenance; the readiness crew facility (Building 104) for dormitory and dining facilities; the rifle range; and an area west of the main runway for driving skills practice with bulldozers, dump trucks, and other industrial equipment. The MANG activities would utilize base utility systems; however, demands would be negligible. The MANG anticipates relocating to the base within the first 5 years after closure.



EXPLANATION

- Base Boundary
- Sawmill
- Michigan Army National Guard
- Correctional Institution
- Waste to Energy/Recycling
- Waste to Energy/Environmental Support Operations

Other Land Use Concepts

0 950 1900 3800 Feet

Figure 1.4-6

Correctional Institution. The correctional institution concept would include approximately 273 acres, or nearly 6 percent of the total base area, for development of a maximum security correctional facility. Construction of the correctional facility is proposed to begin 5 years after closure and could be complete by 2015.

The correctional institution would occupy the northwest portion of the base in the undeveloped area west of the runway. The correctional facility would include living quarters and administrative, maintenance, and warehousing facilities. Total facility construction would be approximately 500,000 square feet and consist of one- and two-story buildings sited within a fenced compound and surrounded by a buffer zone. The prison would house 1,600 inmates and provide approximately 250 full-time jobs.

Sawmill. The sawmill concept would include approximately 142 acres, or 3 percent of the base area, for use as a sawmill including a dry kiln and planing mill. Construction of the sawmill operation would begin immediately after closure.

The sawmill would occupy an area in the southern portion of the base and would include the Weapons Storage Area and Building 441 north of Avenue A. The facility would require construction of a sawmill, boiler, planing mill, and dry kiln.

The sawmill would employ approximately 90 personnel at the base and would process between 45 and 75 million board feet of timber annually. Timber for the mill would be obtained from the northern Lower Peninsula of Michigan, the Upper Peninsula, and from northeast Wisconsin and would consist of spruce, balsam, pines, hemlock, and tamarack.

Waste to Energy/Recycling. This concept would include the use Buildings 417, 419, and 735, and the base heating plant for use as a recycling center and waste to energy facility utilizing municipal solid waste as a fuel source. Construction of the initial pilot system and operation would begin immediately after closure.

This concept would employ approximately 50 personnel at the base and would operate 24 hours a day. In addition, approximately 20 to 30 visitors per week are anticipated for tours of the operation or for training.

Waste to Energy/Environmental Support Operations. This proposed land use concept would involve reuse of the Education Center (Building 540), Heating Plant, Hobby Shop (Building 824), Base Exchange (Building 643), and Service Station (Building 826).

Under this concept, a waste to energy incineration system would be put into operation at the base heating plant after the base closes.

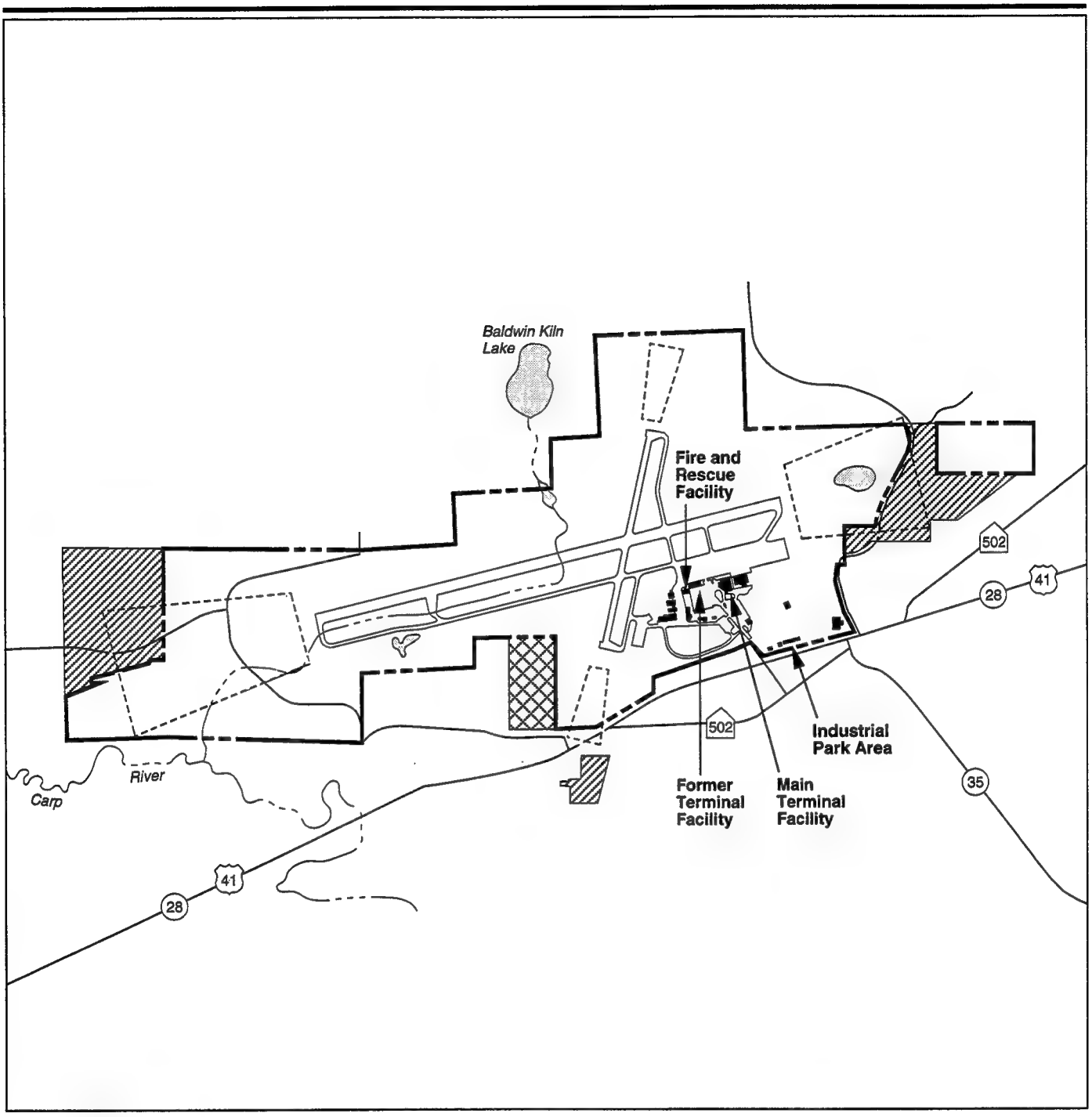
Electricity generated by the facility would be sold to a utility company and heat would be provided to on-base facilities. Ash from the incineration process would be taken to an enclosed facility for recovery of ferrous materials; the remainder would be taken to a landfill for disposal or utilized as aggregate in road base and other construction materials.

Other operations associated with this land use concept would be handling and temporary storage of hazardous materials and wastes collected from cleanup or spill response activities, tank removal/installation, and construction services.

This concept would employ approximately 100 personnel and the waste to energy incineration system would operate 24 hours per day.

1.4.7 Closure and Reuse of the Marquette County Airport

The Proposed Action, International Wayport Alternative, and Commercial Aviation Alternative call for the closure of Marquette County Airport and the relocation of its activities to K. I. Sawyer AFB. Retention of commercial aviation activities at K. I. Sawyer AFB under the above reuse alternatives would preclude the need for another commercial airport facility in the county of Marquette; therefore, it was assumed that Marquette County Airport would close under these reuse options. For the analysis, it was also assumed that Marquette County Airport operations would phase over to K. I. Sawyer AFB during the first 5 years following base closure in September 1995. Closure of Marquette County Airport would make a total of 670 acres of county-owned property available for redevelopment (Figure 1.4-7). In addition to the airport-owned property, another 90 acres are in avigation easements and 70 acres are leased. The airport property consists of the main terminal building; fire and rescue facility; an old terminal facility; and 12 hangar, maintenance, and storage facilities. These facilities cover approximately 110,000 square feet. In addition, the airport property includes an industrial park along U.S. Highway (U.S.#) 41 that is mostly undeveloped. It was assumed that employment for the site would be less than the approximate 400 airport employees in 1991.



EXPLANATION

- Marquette County Airport Property Line
- Approach Clear Zone
- Avigation Easement
- Leased Property
- 41 U.S. Highway
- 35 State Highway
- 502 County Road

0 500 1000 2000 Feet

Marquette County Airport

Figure 1.4-7

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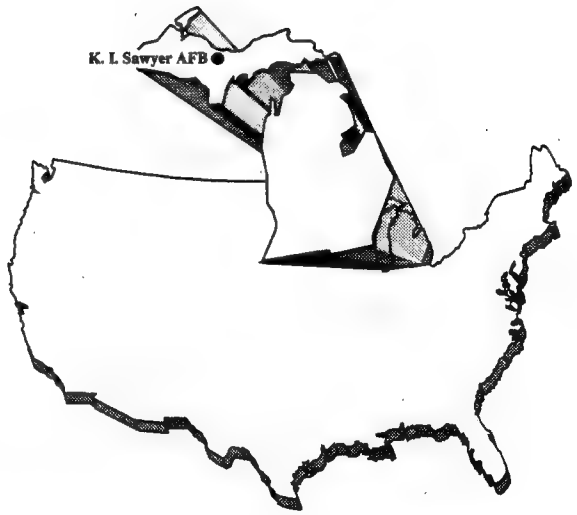


CHAPTER 2
COMMUNITY SETTING AND REGION OF INFLUENCE

2.0 COMMUNITY SETTING AND REGION OF INFLUENCE

This chapter describes the community setting in which K. I. Sawyer AFB is located. In addition, the ROIs for the various issues (economic activity, population, housing, public services, public finance, transportation, and utilities) are also identified.

2.1 COMMUNITY SETTING

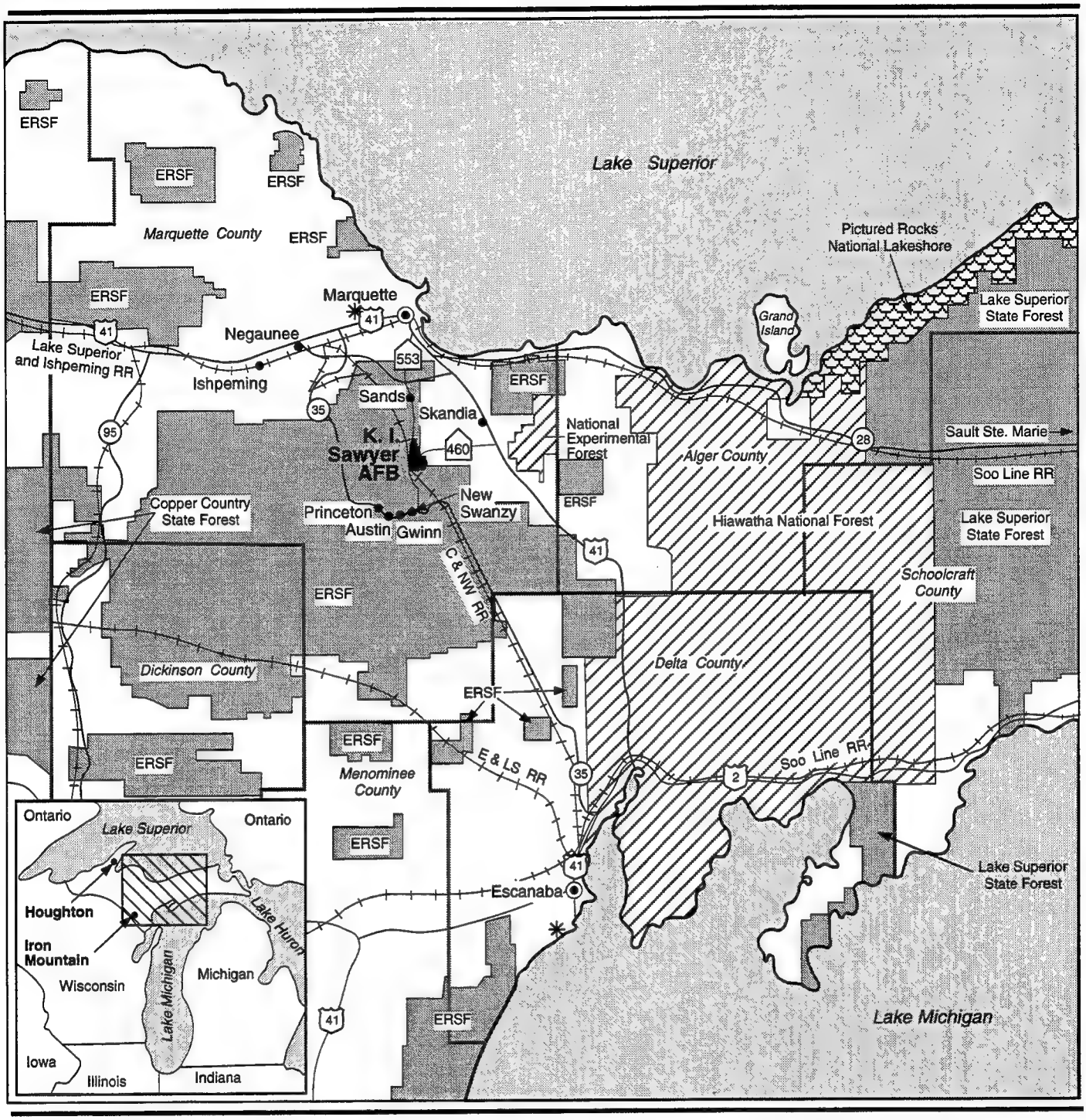
K. I. Sawyer Airport became an air base in January 1955 with the signing of an agreement between Marquette County and the U.S. Government. The airport was named for Kenneth I. Sawyer, a former Marquette County Highway Department Supervisor. Joint use between the county and the U.S. Government began in 1955, with the site being transferred to Air Force control in 1956. Non-military operations ceased in 1957. On January 8, 1956, K. I. Sawyer AFB became the home of the 473rd Fighter Group, a unit of the Eastern Air Defense Force (Air Defense Command); however, the runway was not officially opened until October 1959, when the host unit was the 56th Fighter Wing.

In February 1963, the 4042nd Strategic Wing was discontinued and the 410th Bombardment Wing, now called the 410th Bomb Wing, was activated. Since 1963, the Wing has conducted operations using the B-52H "Stratofortress" and the KC-135A "Stratotanker."

K. I. Sawyer AFB, which encompasses 4,923 acres of leased and fee-owned property, is located in Marquette County in the central Upper Peninsula of Michigan, 440 miles northwest of Detroit, Michigan. Sands Township has 62.4 percent of the base within its jurisdiction, with Forsyth Township having 30.6 percent and West Branch Township 7.0 percent. The base is located about 5 miles north of the community of Gwinn and 20 miles south of the city of Marquette (Figure 2.1-1).

K. I. Sawyer AFB adjoins County Road (CR) 553 approximately 5 miles north of its intersection with State Highway (SH) 35. The area has rail freight service but no rail passenger service. The closest commercial airport is Marquette County Airport, a commuter air carrier and general aviation airport.

Marquette County and surrounding areas offer fishing, hunting, boating, camping, and other recreational opportunities. Located on the southern shore of Lake Superior, the county has several large inland lakes, and a large portion of its area is covered by the Escanaba River State Forest, which also surrounds K. I. Sawyer AFB. Winter sports are a major regional attraction in the area, with more than 150 miles of groomed snowmobile trails, one of



EXPLANATION

- Airport
- U.S. Highway
- State Highway
- County Road
- National Forest
- State Forest
- ERSF Escanaba River State Forest
- E & LS Escanaba and Lake Superior
- C & NW Chicago and Northwestern

Regional Map

Figure 2.1-1

only two luge courses in North America, and designation as the nation's third Olympic education center.

The government sector (federal, state, and local government units) provides more regional jobs than any other major industrial sector, followed by the services (principally medical, tourism and recreation, and general business services) and retail trade sectors. Federal government employment is influenced by personnel stationed and employed at K. I. Sawyer AFB (which supported approximately 5,070 active duty military and civilian personnel in 1992), as well as by persons employed in natural resource management (e.g., forest, mineral resources, and wildlife management) activities in the area. Abundant forest and mineral resources also provide both direct and indirect employment opportunities for many residents, primarily in lumber and wood products industries, manufacturing, and mining operations.

In November 1993, a total of 97.2 percent of active duty military and civilian personnel assigned to K. I. Sawyer AFB (including the 6,171 persons living on base) resided in Marquette County, 1.7 percent in Delta County, and 1.1 percent outside the ROI.

Townships are the smallest form of local government, except where incorporated cities are present, in all counties throughout Michigan. Townships are typically responsible for fire protection services (either through volunteer departments or full-time fire departments), may also provide their own law enforcement services, and often provide utility services such as sanitation, and water and wastewater treatment facilities for local residents (where private wells and septic systems are not used). Within incorporated cities, many of these functions within the corporate boundaries are the responsibility of the city. The percentage of base workers living in Forsyth, West Branch, and Sands townships are 56.0, 17.5, and 13.1, respectively.

Gwinn is an unincorporated community located in Forsyth Township and home to 13.9 percent of base workers. For purposes of analysis, all effects to Gwinn are included in Forsyth Township.

The cities of Ishpeming, Marquette, and Negaunee are the principal support communities for the base.

Ishpeming had a population of 7,200 in 1990 and is home to 0.7 percent of base workers. The city is located about 23 miles northwest of the base. Most businesses are located along U.S. 41, which crosses the northern portion of the city north of and approximately parallel to SH 28. The remainder of the population is outside incorporated areas within Marquette and Delta counties.

Marquette, with a 1990 population of 21,977, is the largest city in the county and home to 5 percent of base workers and 31 percent of the county population. Residential areas are centrally located, extending from the western city limit, surrounding the campus of Northern Michigan University (NMU), to the shore of Lake Superior on the east. Most commercial development is found in the northern and southern areas of the city.

Negaunee had a population of 4,741 in 1990 and is located about 19 miles northwest of the base; 1.0 percent of base workers live in the city. The central business district is located along east-west SH 28.

Several units of local government provide services to the population associated with K. I. Sawyer AFB. These jurisdictions include Marquette County, the townships of Forsyth, Sands, and West Branch; and the city of Marquette. The Gwinn Area Community Schools provide public elementary and secondary education services to children living on K. I. Sawyer AFB, and serves residents in Forsyth, Sands, West Branch, and Skandia townships; while the Marquette Area Public Schools serve the townships of Marquette and Chocolay, and the city of Marquette.

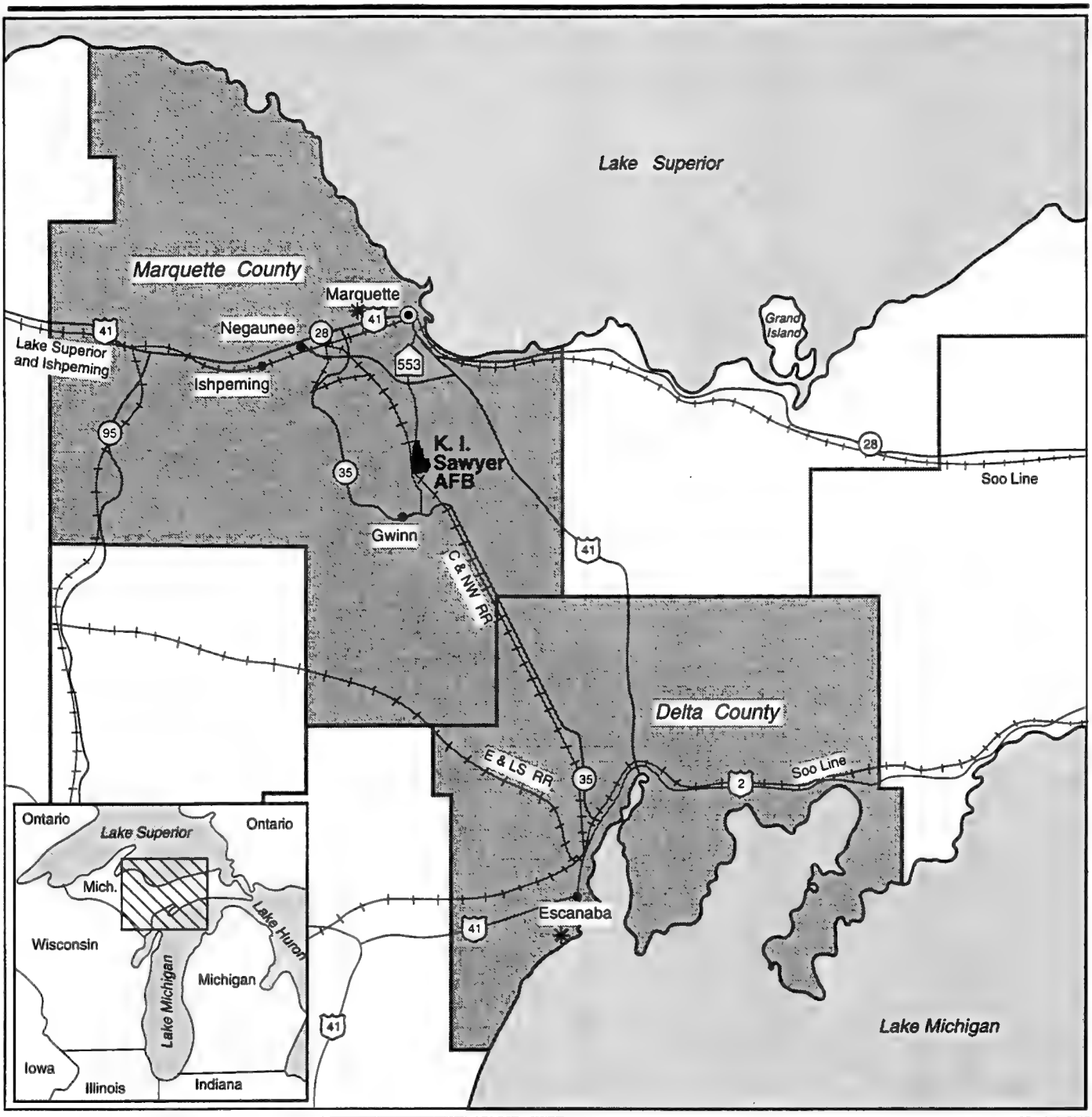
Utilities are provided to K. I. Sawyer AFB from both on-base and off-base sources. The base derives its water from on-base wells. The base wastewater is treated at the on-base WWTP. Solid waste generated on base is hauled to the Marquette County landfill in Sands Township by a private contractor. Base electricity is purchased from the Upper Peninsula Power Company (UPPCO). Natural gas fuels the base central heating system, and is supplied to the base by the Michigan Gas Company. Coal and wood are also used to heat the base.

Utilities for the adjacent communities are provided by the city of Marquette and Forsyth Township for water supply and wastewater systems, Marquette County for solid waste, UPPCO and the city of Marquette Board of Light and Power for electricity, and the Michigan Gas Company and the Michigan Consolidated Gas Company for natural gas.

2.2 REGION OF INFLUENCE

The ROI is defined as the region in which the principal direct and secondary socioeconomic effects of closure and reuse actions at K. I. Sawyer AFB are likely to occur and are expected to be of most consequence for local jurisdictions (Figure 2.2-1). It is important to note that the ROI may vary from one issue area to another.

Two factors were important in determining the ROI used in this analysis. The first was the distribution of residences for military and civilian personnel stationed at K. I. Sawyer AFB in 1993. This residential distribution is not



EXPLANATION

- ✳ Airport
- 41 U.S. Highway
- 35 State Highway
- 553 County Highway
- C & NW Chicago and Northwestern
- E & LS Escanaba and Lake Superior

0 3.5 7 14 Miles

Region of Influence

Figure 2.2-1

only an aid in determining where the greatest effects of closure would occur, but also provides a guide to where the possible effects of reuse would occur, since it reflects the revealed preferences of those employed at the base. Data for this residential distribution were obtained by zip code for all personnel employed at the base for whom data were available.

The second factor in determining the extent of socioeconomic effects is the degree of linkage among the economies of the various communities in the region. This linkage, based on trade among sectors within the region, determines the nature and magnitude of multiplier effects of actions at the base. While both the residential locations of K. I. Sawyer AFB personnel and the nature of economic interactions in the region helped define the ROIs for this analysis, other specific socioeconomic factors, such as service area boundaries, were also used in selection of ROIs discussed in this document.

Economic Resource Impact Statements

Regional purchases associated with K. I. Sawyer AFB, including both base spending for goods and services and base personnel spending of payrolls, are reported in K. I. Sawyer AFB's Economic Resource Impact Statements (ERISs). The ERISs for the past five federal fiscal years (FYs), 1988 through 1992, were examined. The regional expenditures cited in these statements are reported for an area within a 50-mile radius of the base, which includes the counties of Marquette and Delta, and all or parts of six other counties in the Upper Peninsula. While this 50-mile radius serves as a departure point in defining the ROI, it is often too wide an area for pinpointing where the socioeconomic effects could occur within the region. Consequently, this 50-mile radius was not used to define the ROIs.

Economic Activity

Most demands associated with regional economic effects of base closure are anticipated to be concentrated within Marquette and Delta counties. It is anticipated that almost all of the regional reuse demands associated with construction and operation payroll expenditures, and most of the demands associated with construction and operation goods and services expenditures, could occur within this two-county ROI. Potential secondary effects that may occur outside the ROI are expected to be minimal after dispersion and are excluded from further analysis.

In 1991, there were 52,162 jobs in the ROI. Marquette County accounted for 34,520, or 66.2 percent of jobs in the ROI. Government employment (federal military, federal civilian, state, and local) accounted for 26.2 percent, the services sector 23.6 percent, and retail trade 19.5 percent. Cleveland Cliffs Iron Company, an iron ore mining operation in Ishpeming, is the single largest private employer, with approximately 2,200 employees. Marquette General Hospital (1,200 employees) and Northern Michigan

University (1,020 employees) are other major employers in Marquette County. Mead Publishing Paper is the largest employer in Delta County, providing 1,500 jobs. The Escanaba Public School System, employing 500 workers in 1993, and St. Francis Hospital, providing 293 jobs, are other major employers in the county. The majority of employers in the ROI employ less than 10 persons.

K. I. Sawyer AFB also contributes to the ROI's economic base. K. I. Sawyer AFB employed 4,637 military and civilian personnel as of September 30, 1991. Military employment comprised 7.4 percent of ROI jobs in 1991, well above the state average of 0.8 percent and national average of 1.9 percent.

The number of jobs in the ROI grew at an average annual rate of 1.5 percent for the 21-year period from 1970 through 1991. The more recent 1980-1991 period experienced a slower growth rate of 1.2 percent. Over the 1970-1991 period, the civilian labor force grew at a 1.3 percent annual rate. The ROI unemployment rate increased from 6.7 percent in 1970 to 10.1 percent in 1991. This may have been caused by an increase in the number of persons in the ROI working multiple jobs and a rise in the number of commuters from outside the ROI filling jobs within the ROI. By comparison, annual state-wide jobs increased by 1.3 percent and 1.4 percent and national jobs by 2.0 percent and 1.7 percent between 1970-1991 and 1980-1991, respectively.

Population

Population effects from the closure and potential reuse of K. I. Sawyer AFB are analyzed for an ROI of Marquette County, which includes the townships of Forsyth, Sands, and West Branch and the cities of Ishpeming, Marquette, and Negaunee, and Delta County. This ROI accounts for 98.9 percent of the places of residence of civilian and military personnel employed at K. I. Sawyer AFB.

The population in the two-county ROI totaled 109,500 in 1991, having increased at an average annual rate of 0.4 percent between 1970 and 1991. From 1980 to 1991, the ROI population decreased at an average annual rate of 0.3 percent.

The population of Marquette and Delta counties declined 0.3 percent per year and 0.2 percent per year, respectively, from 1980 to 1991. Over the same period, the population of Forsyth Township decreased annually by 0.8 percent, while the population in Sands and West Branch townships increased annually by 1.0 and 0.4 percent, respectively. The cities of Ishpeming, Marquette, and Negaunee decreased at annual rates of 0.4, 0.5, and 0.8 percent, respectively.

There were 964 military retirees living in the ROI in FY 1992, 20.9 percent of the active duty military assigned to the base in that year.

Housing

Housing effects from the closure and reuse of K. I. Sawyer AFB were analyzed for the ROI, defined as Marquette and Delta counties, the townships of Forsyth, Sands, and West Branch, and the cities of Ishpeming, Marquette, and Nagaunee. Because housing effects are expected to follow the distribution of population effects discussed above, the ROI for housing issues is the same as for population issues.

Total ROI housing units, excluding on-base units, numbered 47,172 in 1990, having increased an average of 0.4 percent annually since 1980. The housing stock in Marquette and Delta counties grew 0.2 percent and 0.6 percent per year, respectively, over this same period. Forsyth Township experienced an annual decline in housing stock of less than 0.1 percent. This may be the result of the older housing stock not being replaced due to the decreasing population and a resultant decrease in housing demand. Sands and West Branch townships experienced annual housing growth rates of 2.0 percent and 3.3 percent, respectively. The housing stock for the cities of Ishpeming, Marquette, and Negaunee decreased by 0.2, less than 0.1, and 0.4 percent per year, respectively.

Public Services

The ROIs for the public services analysis (i.e., general government, public education, police and fire protection, and health care) are the principal jurisdictions that have the closest linkages to K. I. Sawyer AFB. These are the jurisdictions providing services directly to K. I. Sawyer AFB military and civilian personnel or their dependents, those having public service and facility arrangements with the base, and those likely to be affected most by potential reuse of the base.

Potentially affected jurisdictions include Marquette County; the townships of Forsyth, Sands, and West Branch; and the city of Marquette. School districts that would be affected by closure and reuse of the base include the Gwinn Area Community Schools and Marquette Area Public Schools.

Marquette County provides general administration and planning services; law enforcement services in unincorporated areas of the county; countywide judicial services; public health and other social services; water, wastewater, and sanitation services; and county road maintenance. Forsyth, Sands, and West Branch townships provide limited public services, such as volunteer fire departments, emergency response, sanitation, road clearing, recreation, and general administrative services. Forsyth Township also maintains its own police force. The city of Marquette provides general government and

planning services inside the city limits, public health and safety services (police, fire, and building inspection), sanitation services, recreation and cultural services, and city road maintenance.

The K. I. Sawyer AFB police and fire departments have mutual aid agreements with other area police and fire departments, including Marquette County, the townships of Forsyth, Sands, and West Branch, and the city of Marquette.

Gwinn Area Community Schools provide elementary and secondary public education to the area surrounding the base (Forsyth, Sands, Skandia, and West Branch townships) and to 81.9 percent of the students from the base. The district operates one elementary school on base and one elementary school adjacent to the base. Student enrollment in the Gwinn Area Community Schools has increased in the past 3 years, from 2,969 in fall 1990 to 2,984 in fall 1992. In fall 1992, a total of 1,743 students, or 58.4 percent of total district enrollments, were dependents of military and civilian personnel associated with K. I. Sawyer AFB. Of that total, 1,585 were active duty military dependents.

Marquette Area Public Schools provide public elementary and secondary education to 8.1 percent of the students associated with K. I. Sawyer AFB. Student enrollment in fall 1992 was 5,015 students, essentially unchanged from the fall 1990 enrollment of 5,011. In fall 1992, an estimated 173, or 3.5 percent, of district enrollments were related to K. I. Sawyer AFB, of which 123 were military dependents.

NMU is the principal institution of higher education closest to K. I. Sawyer AFB, with an estimated 1992 enrollment of 8,600 students. NMU also conducts a variety of classes at the base.

Public Finance

The ROI for public finance consists of the local governmental units that are expected to incur the majority of effects from base closure and/or potential reuse. These jurisdictions include Marquette County; the townships of Forsyth, Sands, and West Branch; the city of Marquette; and the Gwinn Area Community Schools and the Marquette Area Public Schools.

These local government units provide services to K. I. Sawyer AFB area residents using funds raised principally through taxes, charges to community residents, and local organizations for services, state transfers, and federal transfers.

The Gwinn Area Community Schools received general fund revenues from federal, state, local, and other miscellaneous sources. Federal financing included $2.6 million from the Federal Impact Assistance Program

(P.L. 81-874) in school year 1992-1993. State funding is tied to enrollment and attendance levels. Effective January 1994, local property taxes are not available to local school districts throughout the state. While no alternative funding sources have been explicitly earmarked to replace this revenue source, the governor's office has proposed increases in statewide sales, tobacco, and single business taxes; a new statewide property tax on businesses and non-residential homes; and implementation of a statewide property transfer tax.

The Marquette Area Public Schools received general fund revenues from federal, state, local, and other miscellaneous sources. The district receives no funding from the Federal Impact Assistance Program (P.L. 81-874). State funding is tied to enrollment and attendance levels.

The K. I. Sawyer Base Conversion Authority was formed in September 1993 (Senate Bill 763) to help facilitate the conversion of the base to civilian use. The authority consists of 11 voting members who represent Marquette County, the three townships within whose boundaries the base is located (Forsyth, Sands, and West Branch townships), and other community interests in the region. The authority cannot levy taxes but receives funding from local, state, and federal government agencies, as well as private individuals or groups, foundations, or other private entities.

Transportation

The ROI for the transportation analysis includes the local communities of Marquette, Gwinn, Skandia, and Little Lake, with emphasis on the area surrounding K. I. Sawyer AFB. Within this geographic area, the analysis examines the principal road, air, and rail transportation networks, including the segments in the region that serve as direct or indirect linkages to the base. Also included are transportation networks that would be affected during reuse, including those commonly used by military and civilian personnel at K. I. Sawyer AFB.

K. I. Sawyer AFB is located in the central portion of Marquette County. Regional roads include U.S. 41, SH 28, and SH 35. SH 28 provides access between the city of Sault Ste. Marie, Michigan, 140 miles to the east, and the city of Marquette. U.S. 41 connects the city of Marquette to the city of Escanaba, Michigan, 60 miles to the south. SH 35 connects the cities of Negaunee and Escanaba. Access to the base is from CR 462 and CR 460. The main gate is off CR 462, which connects to CR 553. Gate 2 is on CR 460, which connects to U.S. 41 and extends northwest to the city of Marquette. Gate 3 is on Sporely Lake Road. CR 553 is the major north/south link connecting to CR 480 on the north and SH 35 on the south. Other local roads in the area include CR 456, CR 545, and CR 94.

The Chicago and Northwestern Railroad provides freight service via a rail spur to K. I. Sawyer AFB. Amtrak does not service the ROI.

Utilities

The ROI for the utilities analysis (water supply and distribution, wastewater collection and treatment, solid waste collection and disposal, and energy supply and distribution) generally consists of the service areas of the local purveyors that serve K. I. Sawyer AFB, the city of Marquette, and Forsyth Township. Water and wastewater treatment are provided to the built-up areas by municipal water and sewer systems. Private wells and septic systems are used in the non-built-up areas. The base has its own water and wastewater facilities that provide service to base facilities. Marquette County provides solid waste disposal services to the ROI.

Residential and base electricity are supplied to the ROI by the UPPCO. The Marquette Board of Light and Power also provides electricity in the ROI. Natural gas service is provided in the ROI by the Michigan Gas Company and the Michigan Consolidated Gas Company. The base has a central heating plant that serves the main cantonment and uses natural gas, coal, and wood chips. Other areas on base have individual gas heating.

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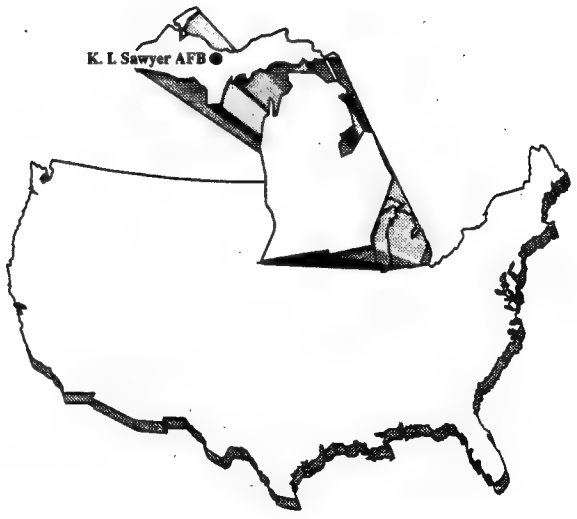


CHAPTER 3
SOCIOECONOMIC CONDITIONS

3.0 SOCIOECONOMIC CONDITIONS

3.1 INTRODUCTION

This chapter presents recent socioeconomic trends in the region (preclosure conditions), and outlines the effects of base closure (closure conditions) for comparison with projected effects of each potential reuse.

Of particular importance in this analysis are the site-related and migratory-related effects. Site-related effects are defined as the activities associated with the base area. These would include both direct and secondary employment and the resultant effects on population. Migratory-related effects are defined to be the persons who would leave the ROI because of closure-related reductions in employment, and the corresponding effects on population, housing, public services, public finance, transportation, and utilities.

The migratory-related effects are a component of the site-related effects. For example, the site-related employment effects are the total job losses due to closure of the base. Some of these newly unemployed people would leave the region to seek employment elsewhere, thus resulting in migratory-related effects. The difference between the site-related effects and migratory-related effects is the portion of people who would lose their jobs due to closure and would remain in the ROI, adding to the available labor pool. Persons unrelated to the site-related activities who would leave the ROI due to closure are not included in the analysis.

A summary of conditions at closure of K. I. Sawyer AFB is provided in Table 3.1-1. The methods, data, and technical approach used in analyzing regional socioeconomic conditions due to base closure are discussed in Appendix B.

3.2 ECONOMIC ACTIVITY

This section presents recent trends in regional employment, earnings, and income, and describes the effects of base closure. As defined in Chapter 2, most of the regional economic effects of base closure will be concentrated in the ROI comprising Marquette and Delta counties.

Recent Trends

Jobs. The number of jobs within the ROI totaled 52,162 in 1991. This key measure of regional economic activity increased between 1970 and 1991 an

Table 3.1-1. Effects of Closure of K. I. Sawyer AFB

Resource Category	1992 through Closure in the ROI
Economic Activity	
Employment	Decline of 5,675 direct and secondary site-related jobs
Earnings[a]	Decline of $122,552,910
Population	
Military-related	Decline of 5,876 on-base and 3,033 off-base residents
Civilian-related	Decline of 2,672 additional off-base residents (including military retirees)
Housing	Decline in demand of 2,121 off-base units
Public Services	
General Government, Police and Fire	
Marquette County	Decline of 5,005 in off-base population served
Forsyth Township	Decline of 2,192 in off-base population served
Sands Township	Decline of 458 in off-base population served
West Branch Township	Decline of 334 in off-base population served
City of Marquette	Decline of 986 in off-base population served
Education	Decline in ROI enrollments of 1,851 students
Health Care	K. I. Sawyer AFB medical and dental clinics closed
Public Finance[a]	
Marquette County	Shortfalls of $1,604,013
Forsyth Township	Shortfalls of $52,587
Sands Township	Shortfalls of $41,165
West Branch Township	Shortfalls of $60,220
City of Marquette	Shortfalls of $59,126
Gwinn Area Community Schools	Shortfalls of $2,565,245
Marquette Area Public Schools	Shortfalls of $111,264
Other Relevant Resources	
Transportation	Base-related traffic reductions on local roads
Utilities	Projected demand for water, wastewater, solid waste, electricity, and natural gas would be as much as 31 percent lower than preclosure levels.

Notes: Although K. I. Sawyer AFB is scheduled to close in September 1995, data limitations required that most effects be calculated annually. Because 1996 is the first full calendar year following closure, short-term effects were calculated through that year.
(a) Expressed in constant 1992 dollars.

ROI = Region of Influence

average of 1.5 percent per year (Table 3.2-1). This compares to a 1.3 percent average annual growth rate in the state of Michigan and a 2.0 percent average annual growth rate in the United States over the same period. Job growth in the ROI was more rapid over the 1970-1980 period (1.7 percent per year) than during the 1980-1991 period (1.2 percent per year).

Marquette County accounted for 66.2 percent of jobs in the two-county ROI. The growth rates for jobs over the 1970-1991 period within each of the two counties were similar (1.5 percent per year in Marquette County and 1.4 percent per year in Delta County). Military job growth increased in Delta County (0.6 percent per year), while it decreased in Marquette County (0.5 percent per year). However, civilian job growth was greater in Marquette County (1.8 percent per year) than in Delta County (1.4 percent per year).

Although the number of jobs in the ROI increased at a faster rate than the civilian labor force (1.5 percent per year compared to 1.3 percent per year over the 1970-1991 period), unemployment rates actually increased in the ROI over this period, from 6.7 percent in 1970 to 10.1 percent by 1991. The ROI unemployment rate exceeded that of Michigan (9.2 percent) and the nation (6.7 percent). The unemployment rate in Delta County (11.9 percent) was higher than in Marquette County (9.0 percent). Unemployment rates were greater in Marquette County than in Delta County in both 1970 and 1980.

While the number of jobs may be on the increase, some of these jobs are part-time and some people may hold more than one job. Of the 13,748 new jobs created in the ROI over the 1970-1991 period, approximately 6,200 were created in the services sector and approximately 4,300 were created in the retail trade sector; these sectors tend to employ part-time workers more than other sectors. The Michigan Department of Management and Budget (Wang, 1994) reports that the number of persons holding part-time jobs and more than one job has increased over time. Thus, the number of jobs increased faster than the resident labor force, but some of these jobs may have been held by people living outside the ROI and the percentage of the resident labor force that is unemployed may not necessarily have declined.

Jobs by Major Sector. The major employment sectors within the ROI are government (including federal, state, and local), services, and retail trade (Figure 3.2-1). The government sector provided 13,650 jobs in 1991, or 26.2 percent of all ROI jobs; the services sector had 12,320 jobs, or 23.6 percent; and the retail sector had 10,165 jobs, or 19.5 percent.

Government sector employment numbers are influenced by the personnel stationed and employed at K. I. Sawyer AFB, as well as by persons employed in the natural resource management activities in the area (e.g., federal, state, and local agencies involved in forest, mineral resource, and

Table 3.2-1. Summary of Economic Indicators, Two-County ROI, State of Michigan, and United States
Page 1 of 2

	1970	1980	1990	1991	Average Annual % Change
Marquette County					
Total Jobs	25,320	31,425	34,056	34,520	1.5
Civilian	21,149	27,560	30,274	30,766	1.8
Military	4,171	3,865	3,782	3,754	-0.5
Military, % of Total	16.5	12.3	11.1	10.9	NA
Civilian Labor Force	24,250	33,043	30,275	30,550	1.1
Unemployment Rate	6.9	12.8	8.4	9.0	NA
Earnings per Job (1992$)	23,212	25,592	22,222	23,061	0.0
Per Capita Income (1992$)	10,951	13,772	14,655	15,152	1.6
Delta County					
Total Jobs	13,094	14,190	17,528	17,642	1.4
Civilian	12,982	14,088	17,400	17,516	1.4
Military	112	102	128	126	0.6
Military, % of Total	0.9	0.7	0.7	0.7	NA
Civilian Labor Force	12,244	15,722	17,350	17,450	1.7
Unemployment Rate	6.2	11.5	9.2	11.9	NA
Earnings per Job (1992$)	23,729	25,654	22,366	21,863	-0.4
Per Capita Income (1992$)	11,004	13,710	15,453	15,398	1.6
ROI Total					
Total Jobs	38,414	45,615	51,584	52,162	1.5
Civilian	34,131	41,648	47,674	48,282	1.7
Military	4,283	3,967	3,910	3,880	-0.5
Military, % of Total	11.1	8.7	7.6	7.4	NA
Civilian Labor Force	36,494	48,765	47,625	48,000	1.3
Unemployment Rate	6.7	12.4	8.7	10.1	NA
Earnings per Job (1992$)	23,388	25,611	22,271	22,656	-0.2
Per Capita Income (1992$)	10,969	13,753	14,926	15,235	1.6

NA = not applicable
ROI = Region of Influence

Table 3.2-1. Summary of Economic Indicators, Two-County ROI, State of Michigan, and United States
Page 2 of 2

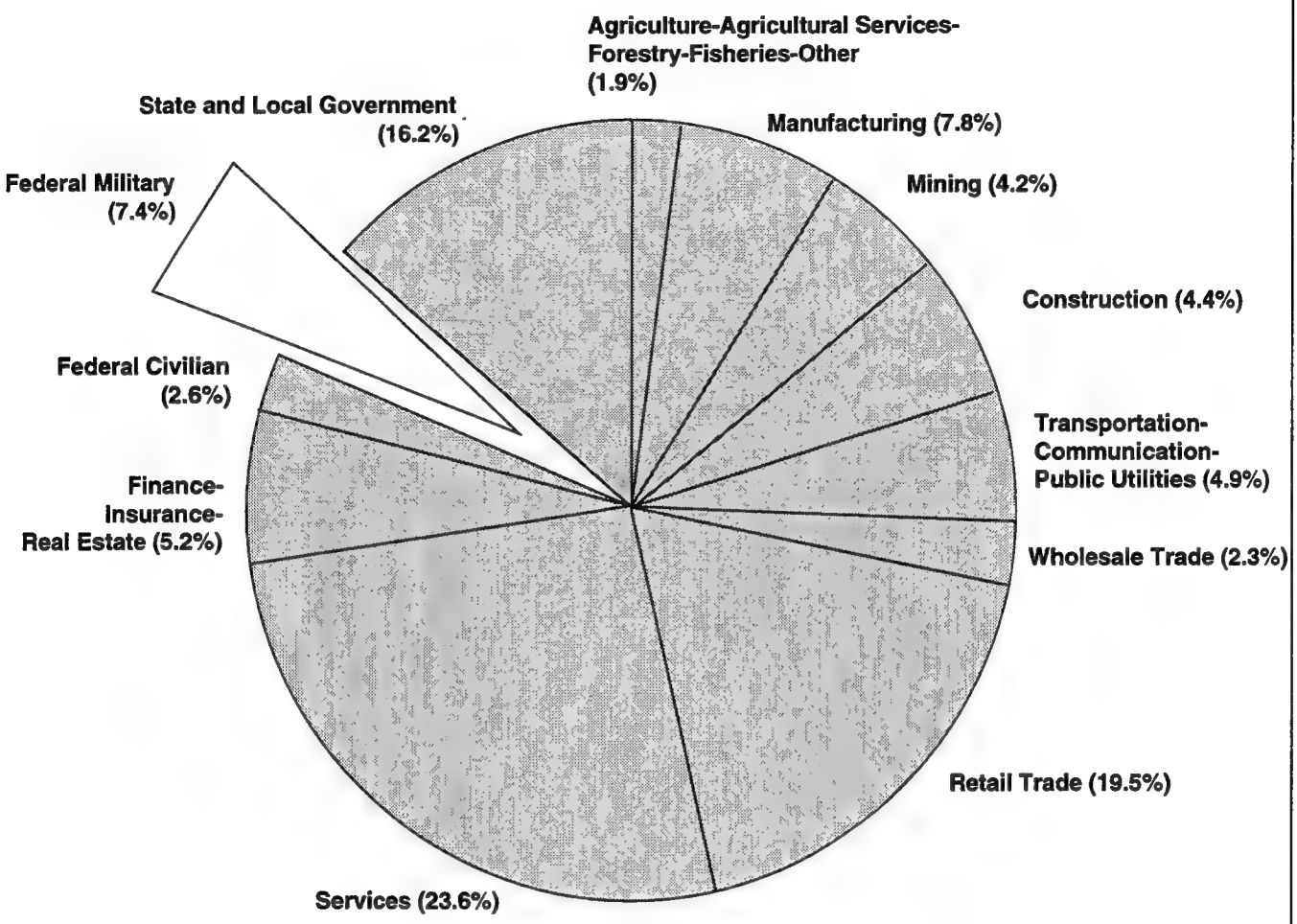
	1970	1980	1990	1991	Average Annual % Change
State of Michigan[a]					
Total Jobs	3,555,010	4,020,008	4,771,155	4,702,322	1.3
Civilian	3,511,777	3,988,122	4,731,023	4,663,059	1.4
Military	43,233	31,886	40,132	39,263	-0.5
Military, % of Total	1.2	0.8	0.8	0.8	NA
Civilian Labor Force	3,590,000	4,292,000	4,578,000	4,543,000	1.1
Unemployment Rate	6.7	12.4	7.5	9.2	NA
Earnings per Job (1992$)	29,260	30,310	27,852	27,340	-0.3
Per Capita Income (1992$)	14,362	17,619	19,730	19,264	1.4
United States[a]					
Total Jobs	91,093,200	113,725,800	138,572,800	137,043,400	2.0
Civilian	87,861,200	111,274,800	135,902,800	134,446,400	2.0
Military	3,232,000	2,451,000	2,670,000	2,597,000	-1.0
Military, % of Total	3.5	2.2	1.9	1.9	NA
Civilian Labor Force	82,711,000	106,940,000	124,787,000	125,303,000	2.0
Unemployment Rate	4.9	7.1	5.5	6.7	NA
Earnings per Job (1992$)	25,125	25,654	26,179	26,033	0.2
Per Capita Income (1992$)	14,086	17,250	20,095	19,728	1.6

Notes: Jobs are full- and part-time civilian and military employment by place of work. Civilian labor force and unemployment rate are by place of residence. Earnings and income are in constant 1992 dollars, reflecting price levels prevailing in 1992. Earnings per job and per capita income were converted to constant 1992 dollars using the Consumer Price Index for all urban consumers/all items. Average annual percent change is compound average for period covering the earliest and most recent years of available data. All values shown represent annual averages. Earnings per job are earnings divided by total jobs, where earnings are the sum of wage and salary disbursements, personal contributions for social insurance, other labor income, and proprietors' income. Per capita income is personal income received by persons from all sources divided by the U.S. Census Bureau mid-year population estimate. Personal income is measured as the sum of earnings, rental income of persons, personal dividend income, personal interest income, and transfer payments, less personal contributions for social insurance.

(a) U.S. Bureau of Economic Analysis included data on partnerships in late 1993. Therefore, some of the data presented are greater than shown in previous Socioeconomic Impact Analysis Studies.

NA = not applicable
ROI = Region of Influence

Sources: U.S. Bureau of Economic Analysis, 1993a, 1993b; U.S. Council of Economic Advisors, 1993.



Source: U.S. Bureau of Economic Analysis, 1993b.

Distribution of ROI Jobs by Major Industrial Sectors, 1991

Figure 3.2-1

wildlife management). Services sector employment is accounted for principally by medical, tourism and recreation, education, and general businesses.

Forestry and mining are not dominant sectors in the local economy as measured by employment levels. The agriculture and agricultural services sectors accounted for 1.9 percent of ROI employment in 1991, and the mining industry accounted for 4.2 percent. The forest and mineral resources in the ROI support a wide variety of industries, such as pulp and paper mills, wafer board mills, saw and dimension mills, furniture plants, and mining operations.

Earnings and Income. Average annual earnings per job and per capita personal income in the ROI were lower than the state and national levels (see Table 3.2-1). In 1991, earnings per job (in 1992 dollars) in the ROI were $22,656, lower than in 1970 and 1980. The pattern of change in the ROI, specifically over the 1970-1980 period, is more severe than that experienced at the state and national levels. While variations in year-to-year growth patterns can be expected to be more severe at the local level than when measured at the state or national level, the differing rates of change over the 1970-1980 period are likely due to the 1979-1981 results of the recession reaching the Upper Peninsula generally later and lasting longer than in the rest of the state (Wang, 1994). By the mid-1980s, the recessionary trends finally reached the Upper Peninsula, with earnings per job returning to nearly 1970 levels.

A comparison of 1991 earnings per job (in 1992 dollars) by sector indicates that mining ($47,801), manufacturing ($34,077), and transportation/public utilities ($33,791) were the three highest sectors. Earnings per job increased between 1980 and 1991 in the agriculture, services, and government sectors, while the seven remaining sectors declined.

In 1991, per capita income in 1992 dollars in the ROI was $15,235, an increase from $10,969 in 1970 (1.6 percent per year). This growth in per capita income in the ROI was greater than that for the state and equal to the nation over the same period.

K. I. Sawyer AFB Employment, Payrolls, and Expenditures. Military jobs comprised 7.4 percent of all jobs in the ROI in 1991. Due to the presence of K. I. Sawyer AFB, the percentage of military jobs was higher in Marquette County (10.9 percent) than in Delta County (0.7 percent). The percentage of military jobs has declined in both counties since 1970. Two factors contributed to the decrease in the region's share of military employment: (1) the number of military jobs decreased by 403 between 1970 and 1991, while (2) over the same period non-military jobs increased, from 34,131 in 1970 to 48,282 in 1991 (including both private sector jobs and civilian jobs within the federal, state, and local government). The number of military jobs

in the ROI decreased at the same rate as the state (0.5 percent per year), and less than the national trend (1.0 percent per year). In 1991, the 3,303 military jobs at K. I. Sawyer AFB represented 85.1 percent of the 3,880 military jobs in the ROI.

K. I. Sawyer AFB supported 5,070 direct jobs in FY 1992 (Figure 3.2-2 and Table 3.2-2). Military personnel accounted for 3,657 jobs, or 72.1 percent of base employment. The remaining 1,413 jobs were held by civilians in the following categories: appropriated fund, nonappropriated fund/Base Exchange, contract, and private business on base. Base employment increased by 125 jobs (100 military and 25 civilian) between FY 1988 and FY 1992.

Table 3.2-2. K. I. Sawyer AFB Employment, Fiscal Years 1988-1992

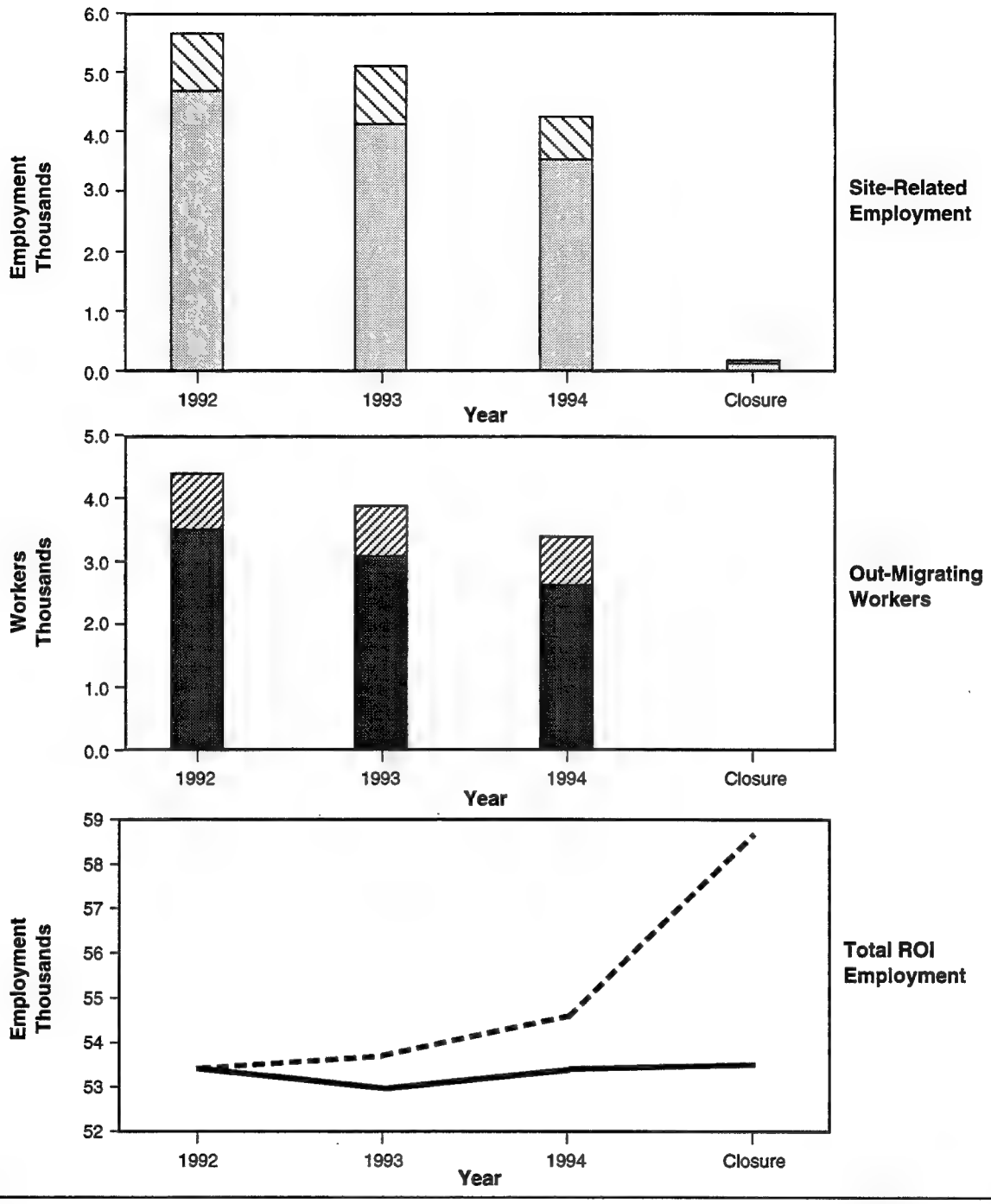
Employment Category	1988	1989	1990	1991	1992
Military Personnel	3,557	3,566	3,319	3,303	3,657
Civilian Personnel	1,388	1,797	1,832	1,334	1,413
Appropriated Fund	536	544	523	492	525
Nonappropriated Fund/ Base Exchange	371	362	357	387	369
Contract	460	873	934	437	503
Private Business on Base	21	18	18	18	16
Total Employment	4,945	5,363	5,151	4,637	5,070

Note: Contract civilians are included in the civilian personnel category (nonappropriated fund) but are considered secondary employees throughout the closure analysis since no direct payroll data were available for calculating direct economic effects. Employees of private businesses on base are considered direct employees.

Sources: U.S. Air Force, 1988, 1989 1990, 1991, 1992a.

Total base payrolls in FY 1992 were $98,897,110, an increase of $14,744,432 between FY 1988 and FY 1992 (Table 3.2-3). A total of 83.7 percent of base payroll is for military personnel, with the remainder associated with civilian personnel. Military payrolls grew 4.2 percent per year while civilian payrolls grew 3.7 percent per year. The total base payroll grew 4.1 percent per year. The payroll associated with the contract civilian personnel is accounted for in the total base expenditure data.

Total base expenditures were $33,707,066 in FY 1992, having increased from $25,071,773 in FY 1988 (Table 3.2-4). Expenditures have fluctuated between $21,976,755 (in FY 1991) and $33,707,066 (in FY 1992). Outlays for construction activities and service contracts accounted for the majority of all expenditures in all years except FY 1988. Outlays for construction activities (military construction program activities as well as other minor construction projects) ranged from 4.2 percent of total



EXPLANATION

- ROI Direct Employment
- ROI Secondary Employment
- Military Employment
- Civilian Employment
- Actual & Closure Projection
- Assumes No Base Closure

Note: Closure represents September 1995.

ROI Site-Related, Out-Migrating, and Total Employment Projections

Figure 3.2-2

Table 3.2-3. K. I. Sawyer AFB Payrolls, Fiscal Years 1988-1992 (current year dollars)

Category	1988	1989	1990	1991	1992
Military	70,250,357	76,362,751	76,374,886	83,833,633	82,816,703
Civilian	13,902,321	14,643,301	14,288,214	14,686,045	16,080,407
Appropriated Fund	11,048,700	11,852,753	11,335,309	11,325,593	12,504,117
Nonappropriated Fund[a] and Other	2,853,621	2,790,548	2,952,905	3,360,452	3,576,290
Total Payrolls	84,152,678	91,006,052	90,663,100	98,519,678	98,897,110

Notes: Monetary data shown are in current-year dollars (i.e., they have not been adjusted for inflation) and, therefore, are not directly comparable with the constant-year monetary data (i.e., adjusted for inflation) presented elsewhere in this document.
(a) Includes private businesses on base and excludes contract civilians due to lack of data.

Sources: U.S. Air Force, 1988, 1989, 1990, 1991, 1992a.

Table 3.2-4. K. I. Sawyer AFB Annual Expenditures, Fiscal Years 1988-1992 (current year dollars)

Expenditure Category	1988	1989	1990	1991	1992
Total Construction	1,063,400	13,905,800	8,724,200	5,441,700	18,878,900
Total Services	9,819,258	10,297,596	10,854,451	7,827,475	6,440,740
Commissary/Base Exchange	3,647,900	3,416,235	3,385,029	2,855,198	3,056,932
Education	2,759,874	2,471,515	2,380,308	2,630,633	2,536,452
Health	734,956	770,123	795,855	821,312	1,313,161
Temporary Duty	88,906	162,900	61,055	36,000	26,248
Other	6,957,479	2,519,509	6,688,891	2,364,437	1,454,633
Total Expenditures	25,071,733	33,543,678	32,889,789	21,976,755	33,707,066

Note: Monetary data shown are in current-year dollars (i.e., they have not been adjusted for inflation) and, therefore, are not directly comparable with the constant-year monetary data (i.e., adjusted for inflation) presented elsewhere in this document. Values include payments to contractors.

Sources: U.S. Air Force, 1988, 1989, 1990, 1991, 1992a.

expenditures (in FY 1988) to 56.0 percent of all expenditures (in FY 1992). Service contracts for building and grounds maintenance, utilities, and custodial services ranged from 19.1 percent of all outlays in FY 1992 to 39.2 percent of all outlays in FY 1988. Local purchases by the Commissary and Base Exchange ranged from 9.1 percent of all outlays in FY 1992 to 14.5 percent in FY 1988.

Closure Conditions

K. I. Sawyer AFB military and civilian employment levels will decline at the base through September 1995 (Table 3.2-5 and Figure 3.2-2). From FY

Table 3.2-5. ROI Employment and Earnings Projections, 1992 to Closure (constant 1992 dollars)

	1992	1993	1994	Closure[a]
Site-Related Employment and Earnings				
Base Operations				
Employment[b]	5,738	5,040	4,220	0
Direct[c]	4,567	4,191	3,500	0
Secondary	1,171	849	720	0
Earnings	124,022,969	113,823,056	95,678,581	0
Direct	98,674,034	96,340,130	80,832,497	0
Secondary	25,348,935	17,482,926	14,846,084	0
Operating Location (OL)				
Employment	0	0	0	63
Direct	0	0	0	50
Secondary	0	0	0	13
Earnings	0	0	0	1,470,059
Direct	0	0	0	1,190,901
Secondary	0	0	0	279,158
Total Site-Related Projections				
Employment	5,738	5,040	4,220	63
Direct	4,567	4,191	3,500	50
Secondary	1,171	849	720	13
Earnings	124,022,969	113,823,056	95,678,581	1,470,059
Direct	98,674,034	96,340,130	80,832,497	1,190,901
Secondary	25,348,935	17,482,926	14,846,084	279,158
ROI Employment				
Employment Projection (without closure)[d]	53,450	53,690	54,566	58,834
Employment Loss (cumulative)[e]	0	-698	-1,518	-5,675
Baseline Projection (with closure)	53,450	52,992	53,048	53,159
Out-Migrating Workers[f]				
Direct	4,066	3,698	3,084	0
Military	3,480	3,073	2,557	0
Civilian	586	625	527	0
Secondary	234	170	144	0
Total	4,300	3,868	3,228	0

Notes:
(a) Closure represents September 1995 conditions. ROI employment closure data are for 1996, the first full year of closure.
(b) Contract civilians were considered secondary employees since payroll data were not available for calculating direct economic effects.
(c) Direct employment for 1994 represents an average of the estimated employment levels for each of the four quarters in that year.
(d) ROI employment projections represent hypothetical future conditions with the base in operation. Estimates were developed from projections prepared by NPA Data Services, Inc. (1993).
(e) Employment loss is calculated as total site-related employment in 1993, 1994, and at closure, minus total site-related employment in the preclosure year (1992).
(f) Out-migrating workers are military personnel and civilian workers who are in the ROI due to their site-related employment and are projected to leave the ROI once their site-related jobs are phased out.

ROI = Region of Influence

Sources: NPA Data Services, Inc. 1993; U.S. Air Force, 1992a, 1994; U.S. Bureau of Economic Analysis, 1993a, 1993b.

1992 to closure, 4,517 direct military and civilian positions would be lost in the regional economy. Because of the decline in base operations, a total of 1,158 secondary jobs (including contract civilians) would be phased out. These secondary jobs would be broadly distributed among services, trade, and other ROI economic sectors.

Not all workers who depend on the base for employment (either directly or indirectly) would move out of the ROI as employment opportunities at the base decline. It is assumed that 3,480 (95 percent) of the military workers and 394 (75 percent) of the civilian appropriated fund personnel would move out of the ROI. The remaining workers would stay in the area. Due to the nature of the other civilian jobs associated with the base (both direct and secondary employment), it is assumed that 192 (50 percent) of the nonappropriated fund and private business employees on base and 234 (20 percent) of the contract civilian and secondary employees would also leave the area. A total of 4,300 workers would out-migrate. In addition, at closure, 193 (20 percent) of the retirees are assumed to leave due to the loss of retirement benefit services.

By closure, direct and secondary site-related earnings levels in the ROI will decline by $122,552,910 (1992 dollars) compared to 1992 levels (see Table 3.2-5).

At closure, an OL will be retained by the federal government to maintain the Air Force fee-owned property in a caretaker status for an indefinite period of time. It is estimated that 50 direct jobs would be required, and worker spending and procurement for small amounts of goods and services would generate 13 secondary jobs in the regional economy. Direct earnings levels are projected to be $1,190,901, with regional secondary earnings projected at $279,158 per year.

Based on 1992 employment data, regional projections, and the effects of base closure, regional employment is projected to decline by 0.5 percent, from 53,450 in 1992 to 53,159 at closure (see Table 3.2-5).

3.3 POPULATION

The population effects of closure of K. I. Sawyer AFB were analyzed at both the regional and local levels. The ROI consists of Marquette and Delta counties. Population effects are further described based on residency patterns and the communities most affected by base closure. These include the townships of Forsyth, Sands, and West Branch, and the cities of Ishpeming, Marquette, and Negaunee.

Recent Trends

ROI Population. The 1991 ROI population was 109,500. Population decreased in the ROI by an average of 0.3 percent annually between 1980 and 1991. This decrease is attributed to the effects of the recession, which lingered longer in the Upper Peninsula than in the rest of the state. During the 1970s, ROI population increased at a rate of 1.2 percent per year. Table 3.3-1 presents population growth trends and growth rates for the ROI counties and communities.

Table 3.3-1. Population Trends for ROI, Townships, and Communities

	Population				Average Annual Growth Rate (%)	
	1970	1980	1990	1991	1970-1980	1980-1991
Marquette County	64,686	74,101	70,887	71,400	1.4	-0.3
Forsyth Township	8,290	9,679	8,775	8,839	1.6	-0.8
Sands Township	2,164	2,437	2,696	2,716	1.2	1.0
West Branch Township	1,870	2,166	2,241	2,257	1.5	0.4
City of Ishpeming	8,245	7,538	7,200	7,252	-0.9	-0.4
City of Marquette	21,967	23,288	21,977	22,136	0.6	-0.5
City of Negaunee	5,248	5,189	4,741	4,775	-0.1	-0.8
Rest of County	16,902	23,804	23,257	23,425	3.5	-0.1
Delta County	35,924	38,947	37,780	38,100	0.8	-0.2
ROI Total	100,610	113,048	108,667	109,500	1.2	-0.3
State of Michigan	8,881,826	9,262,078	9,295,297	9,368,000	0.4	0.1
United States (000)	205,052	227,722	249,975	252,160	1.1	0.9

ROI = Region of Influence

Sources: Michigan Employment Security Commission, n.d.; U.S. Bureau of the Census, 1982c, 1991b.

The negative growth experienced in the ROI between 1980 and 1991 was contrary to that experienced by the state, which grew by 0.1 percent per year, and by the United States as a whole, which experienced average annual growth of 0.9 percent during that period (see Table 3.3-1).

Military Population and Retirees. The total number of military personnel and their dependents assigned to K. I. Sawyer AFB was 9,430 in FY 1992, up 964 persons from the FY 1988 total of 8,466 (Table 3.3-2).

In FY 1992, 6,171 persons, consisting of 2,312 military personnel and their 3,859 dependents, resided in base housing. Of these on-base residents, 3,847 lived in Forsyth Township, 932 in Sands Township, and 1,392 in West Branch Township. The on-base population represented 65.4 percent of military personnel and dependents assigned to the base, lower than the

Table 3.3-2. K. I. Sawyer AFB Military Population, Fiscal Years 1988-1992

Category	1988	1989	1990	1991	1992
Military Personnel	3,557	3,566	3,319	3,303	3,657
Living on Base	2,841	2,798	2,590	2,483	2,312
Living off Base	716	768	729	820	1,345
Military Dependents	4,909	4,829	4,829	4,923	5,773
Living on Base	4,029	3,888	3,863	3,885	3,859
Living off Base	880	941	966	1,038	1,914
Total Military Personnel and Dependents	8,466	8,395	8,148	8,226	9,430
Military Retirees	768	754	867	893	964

Note: Military retiree numbers do not match the base Economic Resource Impact Statements (ERISs) because they capture a larger Region of Influence. Data for retirees shown in this table exclude dependents and are only those persons living in Marquette and Delta counties.

Sources: U.S. Air Force, 1988, 1989, 1990, 1991, 1992a.

average of 79.4 percent for the prior 4 years. The remaining 1,345 military personnel and their 1,914 dependents assigned to the base in FY 1992 lived off base in area communities (see Table 3.3-2). The increase in the 1992 share of military families living off base is due to an increase in military personnel assigned to the base and a decrease in available on-base housing due to a housing renovation program.

Based on 1993 zip code data (see Appendix B), military (on-base and off-base) and civilian personnel reside almost exclusively in Marquette County (97.2 percent). A total of 56.0 percent live in Forsyth Township, 13.1 percent in Sands Township, and 17.5 percent in West Branch Township. The cities of Ishpeming, Marquette, and Negaunee are home to 0.7 percent, 5.1 percent, and 1.0 percent, respectively, of base personnel. A total of 3.8 percent live in the rest of Marquette County and 1.7 percent live in Delta County. The remaining base population (1.1 percent) live outside the ROI.

Military retirees in the two-county ROI numbered 964 in FY 1992 (see Table 3.3-2). Retirees living in the ROI increased from 754 in FY 1989 to 964 in FY 1992. Of these retirees, 76.6 percent live in Marquette County and the remainder live in Delta County.

The number of site-related employees and their dependents, plus military retirees and their dependents, was estimated at 17,413 persons in 1992 (Table 3.3-3). This total included 9,430 military personnel plus dependents, 6,055 direct and secondary civilian workers and their dependents, and 1,928 retired military personnel and their dependents.

Table 3.3-3. Site-Related Population, 1992 to Closure

	1992	1993	1994	Closure[a]
Persons by Labor Category				
Military	9,430	8,327	6,929	0
Civilian	6,055	5,268	4,462	183
Direct	2,648	2,799	2,366	146
Secondary	3,407	2,469	2,096	37
Retired Military	1,928	1,928	1,928	1,542
Total	17,413	15,523	13,319	1,725
Persons by Location				
Marquette County	15,652	14,069	12,017	1,333
Forsyth Township	7,684	7,036	5,956	447
Sands Township	1,746	1,589	1,344	95
West Branch Township	1,980	1,778	1,497	76
City of Ishpeming	387	325	291	86
City of Marquette	1,893	1,648	1,443	307
City of Negaunee	384	343	299	53
Rest of County	1,578	1,350	1,187	269
Delta County	1,475	1,171	1,066	384
ROI Total	17,127	15,240	13,083	1,717
Outside ROI	286	283	236	8
Total	17,413	15,523	13,319	1,725

Notes: Site-related population represents all direct and secondary workers, their dependents, and military retirees and dependents residing in the region as a result of base operations. Retired military personnel are estimated to have an average household size of two persons.

(a) Closure represents September 1995 conditions. The 146 direct population are the Operating Location employees and their dependents.

ROI = Region of Influence

Sources: U.S. Air Force, 1992a, 1994; U.S. Bureau of Economic Analysis, 1993a, 1993b.

Based on the residency patterns discussed above, including the residency patterns of the secondary workers and retirees, approximately 89.9 percent (15,652 persons) of site-related persons in 1992 resided in Marquette County, 8.5 percent (1,475 persons) resided in Delta County, and 1.6 percent (286 persons) resided outside the two-county ROI.

Closure Conditions

Site-Related Population. Site-related population is projected to decrease to 1,725 at closure as the number of jobs associated with the base declines (see Table 3.3-3). Of the total at closure, 146 persons would be OL personnel and their dependents. An additional 37 persons are secondary

employees and their dependents, and 1,542 would be retirees and their dependents.

Out-Migrating Population. Based on the assumptions for out-migrating workers, a total of 11,581 persons (direct and secondary workers plus dependents, and retirees plus their dependents) are estimated to leave the ROI by the time the base closes (Table 3.3-4). Based on the residential distribution of persons leaving the region, Forsyth Township will experience the greatest loss in population (6,039 persons), followed by West Branch Township (1,726 persons) and Sands Township (1,390 persons). All on-base military personnel and their dependents, as well as a large portion of the off-base population (both military and civilian personnel) reside in these three townships, causing population losses to be greatest in these areas. The city of Marquette is projected to lose 986 residents, and Delta County is projected to lose 405 residents. Effects are projected to be less for the city of Negaunee (160) and the city of Ishpeming (143). For a detailed discussion of the out-migrating population assumptions, see Appendix B.

ROI Population with Base Closure. As K. I. Sawyer AFB draws down its missions, ROI population will decrease from its estimated 1992 level of 112,161 persons to 103,322 persons at closure, an average annual decrease of 2.7 percent. Had the base remained open, the ROI population was projected to increase to 114,903 persons, an increase of 0.8 percent per year (see Table 3.3-4). This projection is based on forecasts prepared by NPA Data Services, Inc. (1993).

3.4 HOUSING

Recent Trends

ROI Housing Stock. The number of housing units in the ROI in 1990 (including both seasonal and year-round units excluding units on K. I. Sawyer AFB) totaled 47,172 (Table 3.4-1), representing an increase of 0.4 percent per year from the 45,549 units in the ROI in 1980. The relationship in the ROI between population and housing trends (i.e., slight housing stock growth coupled with a decline in population) is not consistent with that experienced in the state or the nation, where both population and housing increased. This growth in the housing stock was lower than the Michigan growth rate of 0.7 percent and equal to that of the nation.

The total number of off-base housing units increased by 0.2 percent per year in Marquette County, from 28,644 in 1980 to 29,244 in 1990. The housing stock declined due to demolitions and/or removal of mobile homes in an amount that exceeded any new construction in Forsyth Township and in the cities of Ishpeming, Marquette, and Negaunee, but increased in other areas of the county.

Table 3.3-4. Regional Population Projections, 1992 to Closure

	1992	1993	1994	Closure[a]
Migratory-Related Population Changes[b]				
Marquette County	11,176	10,106	8,483	0
Forsyth Township	6,039	5,471	4,578	0
Sands Township	1,390	1,255	1,050	0
West Branch Township	1,726	1,542	1,288	0
City of Ishpeming	143	129	112	0
City of Marquette	986	894	759	0
City of Negaunee	160	152	130	0
Rest of County	732	663	566	0
Delta County	405	354	314	0
ROI Total	11,581	10,460	8,797	0
ROI Population Without Closure				
Marquette County	73,185	73,551	73,992	75,181
Forsyth Township	9,059	9,105	9,159	9,307
Sands Township	2,783	2,797	2,814	2,859
West Branch Township	2,314	2,325	2,339	2,377
City of Ishpeming	7,433	7,471	7,515	7,636
City of Marquette	22,689	22,803	22,940	23,308
City of Negaunee	4,895	4,919	4,949	5,028
Rest of County	24,012	24,131	24,276	24,666
Delta County	38,976	39,093	39,250	39,722
ROI Total	112,161	112,644	113,242	114,903
Closure Effects				
Marquette County[c]	0	-1,070	-2,693	-11,176
Forsyth Township	0	-568	-1,461	-6,039
Sands Township	0	-135	-340	-1,390
West Branch Township	0	-184	-438	-1,726
City of Ishpeming	0	-14	-31	-143
City of Marquette	0	-92	-227	-986
City of Negaunee	0	-8	-30	-160
Rest of County	0	-69	-166	-732
Delta County	0	-51	-91	-405
ROI Total	0	-1,121	-2,784	-11,581
With Closure				
Marquette County	73,185	72,481	71,299	64,005
Forsyth Township	9,059	8,537	7,698	3,268
Sands Township	2,783	2,662	2,474	1,469
West Branch Township	2,314	2,141	1,901	651
City of Ishpeming	7,433	7,457	7,484	7,493
City of Marquette	22,689	22,711	22,713	22,322
City of Negaunee	4,895	4,911	4,919	4,868
Rest of County	24,012	24,062	24,110	23,934
Delta County	38,976	39,042	39,159	39,317
ROI Total	112,161	111,523	110,458	103,322

Notes: (a) Closure represents September 1995 conditions. ROI closure data are for 1996, the first full year after closure.
(b) Migratory-related population represents those site-related employees, dependents, and retirees living in the region who are projected to leave the ROI once the site-related jobs are phased out. All other site-related employees, dependents, and retirees are assumed to remain in the region after base closure.
(c) These values include 6,171 on-base persons in Marquette County (3,847 in Forsyth Township, 932 in Sands Township, and 1,392 in West Branch Township) who out-migrate from the ROI or move elsewhere within the ROI.
ROI = Region of Influence

Sources: NPA Data Services, Inc., 1993; U.S. Air Force, 1992a, 1994; U.S. Bureau of the Census, 1991b.

Table 3.4-1. Housing Units and Vacancies for the ROI: 1980, 1990

County/Community	Total Off-Base Housing Units 1980	Total Off-Base Housing Units 1990	Average Annual Growth (%)	Vacancy Rates (%) 1980	Vacancy Rates (%) 1990 Owner	Vacancy Rates (%) 1990 Renter	Vacancy Rates (%) 1990 Avg.
Marquette County	28,644	29,244	0.2	5.2	1.4	4.7	2.6
Forsyth Township	2,692	2,669	-0.1	4.0	1.9	6.0	4.2
Sands Township	525	640	2.0	NA	3.0	6.8	4.0
West Branch Township	252	347	3.3	NA	1.3	8.8	6.6
City of Ishpeming	3,298	3,224	-0.2	2.6	1.2	6.1	3.0
City of Marquette	8,259	8,216	-0.1	6.6	0.7	2.5	1.6
City of Negaunee	2,154	2,067	-0.4	5.3	1.2	6.0	2.9
Rest of County	11,464	12,081	0.5	5.9	1.8	5.9	2.4
Delta County	16,905	17,928	0.6	3.3	1.7	5.1	2.6
ROI Total	45,549	47,172	0.4	4.5	1.6	4.8	2.6
Michigan (000)	3,590	3,848	0.7	3.1	1.3	7.2	3.1
United States (000)	88,411	91,947	0.4	7.1	2.1	8.5	3.0

Note: Marquette County and Forsyth, Sands, and West Branch townships total housing units were reduced by the number of on-base housing units existing in 1980 and 1990, respectively, as follows: Marquette County 1,886 and 1,805; Forsyth 1,290 and 1,235; Sands 81 and 77; and West Branch 515 and 493. Figures for 1990 are from the 1990 Census of Population and Housing. Figures for 1980 were calculated based on 1990 distribution.

Avg. = average
NA = data not available
ROI = Region of Influence

Sources: U.S. Bureau of the Census, 1982b, 1991a.

Delta County experienced a slightly greater increase (0.6 percent) per year in housing stock than Marquette County. There were 16,905 total units in 1980, increasing to 17,928 in 1990.

ROI Vacancy Rates. The 1990 housing vacancy rate in the ROI, adjusted to exclude seasonal vacancies, was 2.6 percent (see Table 3.4-1). The 1990 rate was lower than the 1980 rate of 4.5 percent. Vacancy rates for the ROI communities ranged from 6.6 percent in West Branch township to 1.6 percent in the city of Marquette.

Vacancy rates for rental housing in the ROI in 1990 were higher than for owner housing (see Table 3.4-1), which was the same for the state and nation as well. The 1990 ROI average vacancy rate of 2.6 percent represented a composite of a lower (1.6 percent) owner vacancy rate and a higher (4.8 percent) renter vacancy rate. These rates exclude seasonal vacancies.

Housing Costs and Tenure. The median value of ROI owner-occupied housing in 1990 was $44,154 (Table 3.4-2). This represented an average

Table 3.4-2. Housing Tenure, Median Value, and Median Contract Rent for the ROI, State of Michigan, and United States: 1980, 1990 (current year dollars)

Area	1980			1990		
	Percent Owner-Occupied[a]	Median Value[b]	Median Contract Rent[c]	Percent Owner-Occupied[a]	Median Value[b]	Median Contract Rent[c]
Marquette County[d]	54.9	37,800	193	55.8	44,800	273
Forsyth Township[d]	53.7	37,300	206	52.2	46,300	313
Sands Township[d]	76.2	50,900	184	75.2	60,900	294
West Branch Township[d]	67.5	45,200	209	64.0	50,400	387
City of Ishpeming	59.2	28,800	166	58.8	33,800	216
City of Marquette	46.5	41,800	208	48.9	50,700	299
City of Negaunee	60.5	32,600	163	62.2	38,400	239
Rest of County[e]	57.8	38,288	161	58.2	43,988	150
Delta County	62.4	33,500	152	61.7	43,200	233
ROI Total	57.7	36,074	183	58.1	44,154	262
Michigan	64.7	39,000	196	63.1	60,600	343
United States	64.4	47,200	198	64.2	79,100	374

Notes: (a) Percent owner-occupied was calculated as owner-occupied housing units divided by total housing units.
(b) Owner-occupied units.
(c) Renter-occupied units (per month).
(d) K. I. Sawyer AFB housing stock was excluded from the calculations for this area.
(e) Median value and median contract rent for this area were estimated using weighted averages. Weights were based on the number of owner-occupied and renter-occupied units, respectively, in each county.

ROI = Region of Influence

Sources: U.S. Bureau of the Census, 1982b, 1991a.

annual increase of 2.0 percent from the 1980 ROI value of $36,074. The proportion of owner-occupied housing in 1990 averaged 58.1 percent in the ROI, greater than the 1980 share of 57.7 percent. The increase from 1980 to 1990 was below the average of 4.5 percent per year for the state and the 5.3 percent annual increase for the nation. The 1990 median home value in the ROI was about 72.9 percent of the state value and 55.8 percent of the national value. Of the ROI communities, homes were most expensive in Sands Township at a median value of $60,900 in 1990, and ranged down to $33,800 in the city of Ishpeming.

The ROI median contract rent for renter-occupied units in 1990, excluding on-base family housing, was $262 per month (see Table 3.4-2). Rents increased an average of 3.7 percent per year in the ROI from 1980 to 1990. The ROI 1990 median rent was about 76.4 percent of the Michigan median rent and 70.1 percent of the national median rent. The average increase per year during the 1980s was lower than the statewide average increase of 5.8 percent and the national average increase of 6.6 percent. Rents were

the highest in West Branch Township ($387 per month) and the lowest in the rest of Marquette County, excluding Forsyth, Sands, and West Branch townships and the cities of Ishpeming, Marquette, and Negaunee.

Housing Construction Trends. Data on new housing units authorized by building permits in the ROI are presented in Table 3.4-3. These data reflect general trends in construction. New authorized units averaged 258 per year in the ROI between 1980 and 1990. Authorized units in the ROI fluctuated between 201 in 1981 and 348 in 1988. In 1992, 526 building permits were issued in the ROI, compared to 343 in 1990.

Table 3.4-3. Total Housing Units Authorized by Building Permits for the ROI

	1980	1990	Average[a] 1980-1990
Marquette County	101[b]	244	146
Delta County	125	99[b]	112
ROI Total	226	343	258

Notes: (a) Averages are calculated for the full 1980-1990 period.
(b) Number shown in table is a partial total for that county since one or more of the subcounty areas did not submit annual reports or, if on list for monthly reporting, reports were received for less than 9 months.

ROI = Region of Influence

Sources: U.S. Bureau of the Census, 1982c, 1991b.

A total of 88.2 percent of the construction authorized in the ROI during the 1980 to 1990 period was for single-family units (U.S. Bureau of the Census, 1981, 1986, 1990, 1991b).

K. I. Sawyer AFB Housing Stock. In 1992, K. I. Sawyer AFB had 1,504 family housing units and transient lodging facilities in its inventory, along with 17 dormitory facilities accommodating 841 persons (Table 3.4-4). These units are located in the southern part of the base and include two-, three-, four-, and five-bedroom units. The number of units on base has fluctuated due to a renovation program. Base housing was constructed in the 1950s and 1960s and is divided into neighborhoods by rank structure.

Closure Conditions

Migratory-Related Housing Demand. The effects on housing demand from closure of the base are presented in Table 3.4-5. These effects represent the number of units vacated by the out-migrating population through the date of closure.

ROI off-base housing demand associated with the base is expected to decrease from 2,121 units in 1992 to 0 units at closure. Approximately

Table 3.4-4. K. I. Sawyer AFB Housing Assets, Fiscal Years 1988-1992

	1988	1989	1990	1991	1992
Family Housing Units	1,697	1,712	1,712	1,712	1,504
Unaccompanied Quarters					
Dormitory Facilities	16	16	17	17	17
Bed Capacity	1,426	1,421	1,415	850	841

Note: Family housing units include six temporary lodging facilities containing 36 units in 1988 and 35 units in the remaining years.

Sources: U.S. Air Force, 1988, 1989, 1990, 1991, 1992a.

Table 3.4-5. Projected Housing Demand, 1992 to Closure

	1992	1993	1994	Closure[a]
Marquette County	1,967	1,823	1,549	0
Forsyth Township	859	808	683	0
Sands Township	179	168	142	0
West Branch Township	132	123	104	0
City of Ishpeming	56	50	44	0
City of Marquette	393	356	303	0
City of Negaunee	60	57	49	0
Rest of County	288	261	224	0
Delta County	154	137	123	0
ROI Total	2,121	1,960	1,672	0

Notes: Data are migratory-related housing demand and reflect demand from the portion of the site-related population that is expected to leave the area after the base closes. On-base housing demand is excluded from this table.
(a) Closure represents September 1995 conditions.

ROI = Region of Influence

92.7 percent of this decrease (1,967 units) will be experienced in Marquette County and the remainder of the decrease (154 units) will be in Delta County.

ROI Housing Demand with Base Closure. The reduction in housing demand, excluding on-base demand, is estimated at 2,121 units. Reductions in housing demand and increases in housing vacancy rates are expected to cause a decline in home prices and rents and a lengthening of the time required to sell or lease residential property. Demand for off-base housing is projected to decrease from 38,587 in 1990 to 36,466 at closure.

3.5 PUBLIC SERVICES

The key public services examined in this analysis are local government administration, public education, police and fire protection, and health care. In the K. I. Sawyer AFB region, providers of these services are county, township, and city governments; public school districts; police and fire departments; and hospitals and medical clinics. The following section presents a discussion of the recent trends and closure conditions for each of these public services in the ROI.

The ROI for studying the effects on public services includes the areas within the region that will experience the greatest population effects and, therefore, the greatest effects on the provision of these services due to the closure and potential reuse of the base. These jurisdictions include Marquette County; the townships of Forsyth, Sands, and West Branch; the city of Marquette; the Gwinn Area Community Schools; and the Marquette Area Public Schools.

The levels of general public service are usually determined by the ratio of employees (e.g., municipal employees, sworn officers, professional fire fighters) per 1,000 of serviced population (per capita generated), and by student/teacher ratios at the primary and secondary public school levels. In addition, staffing per area of service (e.g., per square mile) is used where effects of boundary changes need to be assessed. Minimum staffing requirements were addressed based on interviews with key local government personnel. All numbers of personnel are expressed as full-time equivalents (FTEs).

3.5.1 Governmental Structure

Local governments include counties, townships, and cities. County governments provide countywide services typically covering law enforcement services (sheriff), court and judicial services (including social services), transportation services (maintenance of county roads and, in some instances, operation of regional airports), and general administrative services (registration of legal documents such as for property transactions) (Roberts, 1994). Townships are the smallest form of local government in Michigan, except where incorporated cities are present. Townships typically are responsible for fire protection services (either through volunteer departments or full-time fire departments), and may provide their own law enforcement services, and often provide utility services such as sanitation and water and wastewater treatment facilities for local residents (where private wells and septic systems are not used). For incorporated cities, many of these functions within the corporate boundaries are the responsibility of the city.

Recent Trends

Marquette County. Marquette County was formed in 1848. The Board of Commissioners is the authoritative body in the county. The board consists of ten commissioners, one from each of ten districts in the county, elected at-large for 2-year staggered terms. The county is approximately 1,878 square miles and the county seat is the city of Marquette. Marquette County provides a full range of public services including constructing and maintaining county roads and bridges; providing county law enforcement and legal functions; maintaining public records and recording land transactions; and providing countywide health, recreation, and social services. In 1992, the county employed approximately 418 personnel, excluding 15 sworn sheriff officers analyzed separately (Marquette County, 1993). These staff levels result in a per capita-generated level of service of 6.2 personnel per 1,000 persons for the 67,014 persons living off base (estimated 1992 population of 73,185 persons less 6,171 persons living on base; population living in on-base housing is served by the base). This is equivalent to an area-generated level of service of about 0.22 employee per square mile for the estimated off-base area of 1,870 square miles (total county area of 1,878 square miles less the approximate 8 square miles of base property). The largest departments in the county with respect to county employment are those providing general administrative and health services, and the road commission.

Forsyth Township. Forsyth Township was established in 1844. The township is governed by a board of five members who are elected at-large every 4 years. The township provides general administration, public safety and emergency services, recreation, sanitation, and public water and sewer services. The township employed 17 personnel in 1992, excluding the 7 sworn police officers, 30 volunteer fire fighters, and 9 volunteer emergency medical technicians analyzed separately (Forsyth Township, 1993). This represents a level of service of 3.3 personnel per 1,000 persons for the estimated 5,212 persons in the township who live off base (estimated 1992 population of 9,059 persons less an estimated 3,847 persons who live on base within Forsyth Township). An area-generated level of service would be 0.10 employee per square mile for the estimated off-base area of 178 square miles (180 square miles less the approximate 2 square miles of base property).

Sands Township. Sands Township was established in 1893. The township is governed by a board of five members who are elected at-large every 4 years. Principal services provided by the township are sanitation, fire protection, and emergency services. The township employed a total of three personnel in 1992, excluding 33 volunteer fire fighters analyzed separately (Sands Township, 1993). This represents a level of service of 1.6 personnel per 1,000 persons for the 1,851 off-base population in the township (estimated 1992 population of 2,783 persons less an estimated

932 persons who live on base within Sands Township). An area-generated level of service would be 0.04 employee per square mile for the estimated off-base area of 67 square miles (72 square miles less the approximate 5 square miles of base property).

West Branch Township. West Branch Township was established in 1895. The township is governed by a board of five members who are elected at-large every 4 years. Principal services provided by the township are sanitation, fire protection, and emergency services. Two part-time personnel are employed at the transfer facility, the township office employs 1 part-time person, and the recreation department employs 1 seasonal worker for a total of 2 personnel in 1992, excluding 20 volunteer fire fighters and 14 volunteer first-responders analyzed separately (West Branch Township, 1993). This represents a level of service of 2.2 personnel per 1,000 persons for the 922 off-base population (estimated 1992 population of 2,314 persons less 1,392 persons who live on base within West Branch Township). An area-generated level of service would be 0.06 employee per square mile for the estimated off-base area of 35 square miles (36 square miles less the approximate 1 square mile of base property).

City of Marquette. The city of Marquette was incorporated as a village in 1859 and as a city in 1871. Marquette has a commission-manager form of government. The commission consists of seven members who are elected at-large to staggered 3-year terms. The commission members elect one member to serve as the mayor on an annual basis, and appoint the city manager and city attorney. Local government services include general administrative and legislative functions, public safety (law enforcement and fire protection), building inspections, cultural and recreation services, and utility services (electric, water, and wastewater). In 1992, the city employed 206 personnel, excluding 34 sworn police officers and 23 full-time fire fighters analyzed separately (City of Marquette, 1993). This represents a level of service of 9.1 personnel per 1,000 persons based on the city's population of 22,689 persons. Public safety and general administration are the largest departments in the city.

K. I. Sawyer AFB Base Conversion Authority. The K. I. Sawyer Base Conversion Authority was formed in September 1993 (Senate Bill 763) to oversee the conversion of K. I. Sawyer AFB to civilian use. The authority consists of 11 voting members who represent Marquette County, Forsyth Township, Sands Township, West Branch Township, and other community interests in the region.

Closure Conditions

Because of the loss of population in the ROI from base closure, decreased staffs could maintain 1992 levels of service (Table 3.5-1). Due to projected population declines, Marquette County may reduce the county staff by 31

Table 3.5-1. Migratory-Related Demand for Local Government Employees, 1992 to Closure

	1992	1993	1994	Closure[a]
Marquette County	31	29	24	0
Forsyth Township	7	7	6	0
Sands Township	1	1	1	0
West Branch Township	1	1	1	0
City of Marquette	9	8	7	0
Total	49	46	39	0

Notes: Local government employees represent the effects of migratory-related population changes on the number of government employees required. Data are rounded to the nearest whole employee, except in the closure column. Calculations are based on 1992 level-of-service ratios excluding on-base population. Effects from possible reductions in police and fire services, which are analyzed separately, are excluded.
(a) Closure represents September 1995 conditions.

positions and still maintain preclosure public service levels. In Forsyth Township, total staff levels could be reduced by seven positions. Local government staff levels in Sands and West Branch townships could be reduced by one each. The city of Marquette could reduce staffing levels by nine employees at closure.

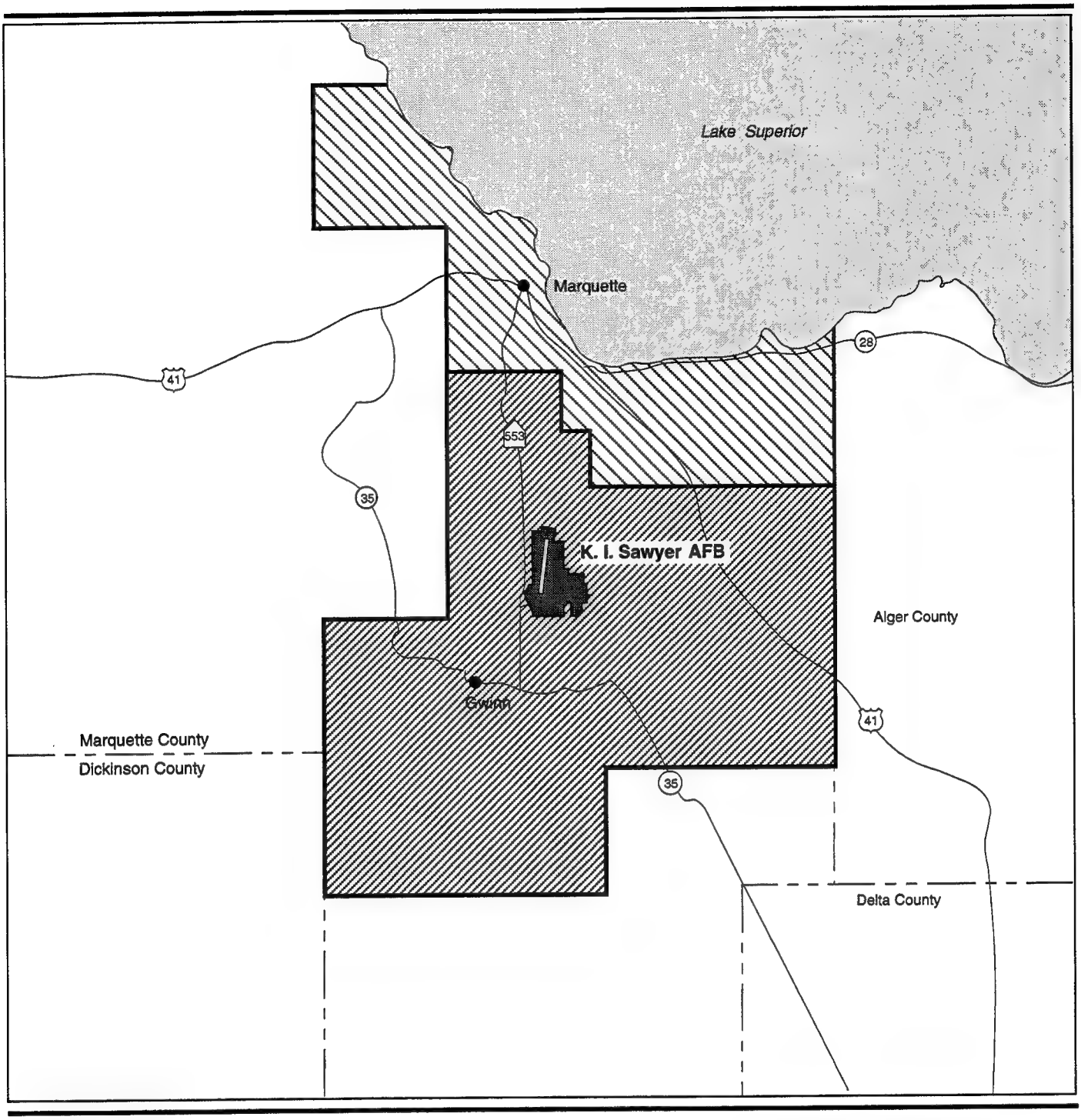
Assuming no other changes in staffing (and excluding effects in law enforcement and fire protection services, which are analyzed separately), these reductions would decrease local government staff levels at closure to 387 employees in Marquette County, 10 in Forsyth Township, 2 in Sands Township, 1 in West Branch Township, and 197 in the city of Marquette. Preclosure levels of service may be maintained with reductions in service hours proportional to population losses. In some cases the local jurisdictions may maintain the same staff level, resulting in a higher level-of-service ratio.

3.5.2 Public Education

Recent Trends

The public education analysis considers two distinct groups. The site-related enrollment refers to all school-age children of site-related employees (all direct and secondary employees associated with the base) within the school district ROI. The migratory-related enrollment refers to all school-age children of migratory-related employees.

The public education ROI comprises two public school districts: the Gwinn Area Community Schools and the Marquette Area Public Schools. These two school districts provide elementary and secondary education for 90.0 percent of students who are dependents of K. I. Sawyer AFB personnel (Figure 3.5-1) and will be most affected by military and civilian personnel changes at K. I. Sawyer AFB.



EXPLANATION

Gwinn Area Community Schools

Marquette Area Public Schools

School District Boundaries

0 2 4 8 Miles

Figure 3.5-1

In 1992, the student/teacher ratio in the ROI was 19.0 (Table 3.5-2), compared to a state average of 20.6 and a national average of 17.2 (Cook, 1992). Between 1990 and 1992, total enrollments in the ROI remained relatively stable at approximately 8,000 students.

Table 3.5-2. Public School District Enrollment (Grades K-12) and Student/Teacher Ratios

School District	Enrollment	Teachers	Students/ Teacher
Fall 1990			
Gwinn Area Community Schools	2,969	172	17.3
Marquette Area Public Schools	5,011	259	19.3
ROI Total	7,980	431	18.5
Fall 1991			
Gwinn Area Community Schools	2,988	180	16.6
Marquette Area Public Schools	4,986	265	18.8
ROI Total	7,974	445	17.9
Fall 1992			
Gwinn Area Community Schools	2,984	184	16.2
Marquette Area Public Schools	5,015	238	21.1
ROI Total	7,999	422	19.0

Note: Data are for school years, measured in the fall of each year; excludes adult education enrollment in the Marquette Area Public Schools (averaging approximately 70 persons per year over these years).

ROI = Region of Influence

Sources: Gwinn Area Community Schools, 1993; Marquette Area Public Schools, 1993.

Gwinn Area Community Schools. The Gwinn Area Community Schools district operates six schools which serve residents in Forsyth, Sands, West Branch, and Skandia townships: four elementary schools (including the K. I. Sawyer Elementary School), one middle school, and one high school. K. I. Sawyer AFB is located within the boundaries of the district, which provides primary and secondary education to residents of military family housing. District enrollment, teaching staff, and service ratios are presented in Table 3.5-2. In fall 1992, with 2,984 students enrolled and a teaching staff of 184 personnel, the student/teacher ratio was 16.2. In fall 1990, with 2,969 students enrolled and a teaching staff of 172 personnel, the student/teacher ratio was 17.3 students per teacher.

Enrollment in the district has fluctuated little over the past 3 years, averaging 2,980 students (Table 3.5-3). Enrollment at the K. I. Sawyer Elementary School is approximately 525 students. Schools in the district are operating at capacity.

Table 3.5-3. Historic Fall Enrollment (Grades K-12) in Public School Districts in K. I. Sawyer AFB Area: 1990-1992

School District	Fall 1990	Fall 1991	Fall 1992	Total % Change	Average Annual % Change
Gwinn Area Community Schools	2,969	2,988	2,984	0.5	0.3
Marquette Area Public Schools	5,011	4,986	5,015	0.1	0.0[a]
ROI Total	7,980	7,974	7,999	0.2	0.1

Notes: Data are for school years, measured in the fall of each year.
(a) Unrounded value is 0.04.

ROI = Region of Influence

Sources: Gwinn Area Community Schools, 1993; Marquette Area Public Schools, 1993.

In fall 1992, dependents of military, direct, and secondary civilian personnel accounted for 1,983 of the district's enrollment of 2,984 (Table 3.5-4). A total of 1,743, or 66.5 percent, of the students in the district were dependents of K. I. Sawyer AFB site-related (direct and secondary) personnel. Of these students, 240 were dependents of secondary workers.

Table 3.5-4. Enrollment Related to K. I. Sawyer AFB

Enrollment Breakdown	Fall 1990	Fall 1991	Fall 1992
Gwinn Area Community Schools			
Total Enrollment	2,969	2,988	2,984
Dependents of Direct Personnel	1,806	1,836	1,743
Military Dependents	1,623	1,668	1,585
Civilian Dependents	183	168	158
Estimated Dependents of Secondary Workers	237	242	240
Total Site-Related Dependents	2,043	2,078	1,983
Site-Related Percentage of Total Enrollment	68.8	69.5	66.5
Marquette Area Public Schools			
Total Enrollment	5,011	4,986	5,015
Dependents of Direct Personnel	151	152	173
Military Dependents	107	108	123
Civilian Dependents	44	44	50
Estimated Dependents of Secondary Workers	137	133	141
Total Site-Related Dependents	288	285	314
Site-Related Percentage of Total Enrollment	5.7	5.7	6.3

Note: Dependents of direct personnel are estimates from the respective school districts. For Marquette Area Public Schools, the number of dependents who are military-related and civilian-related was estimated.

Sources: Gwinn Area Community Schools, 1993; Marquette Area Public Schools, 1993.

Marquette Area Public Schools. The Marquette Area Public Schools district serves the city of Marquette, Marquette Township, and Chocolay Township with seven elementary schools, two middle schools, and one high school. The enrollment in the district totaled 5,015 students in fall 1992. With 238 teachers employed, the student/teacher ratio was 21.1 students per teacher (see Table 3.5-2). In fall 1990, with an enrollment of 5,011 and 259 teachers employed, the student/teacher ratio was 19.3 students per teacher.

Over the past 3 years, enrollment has fluctuated little, averaging about 5,004 students (see Table 3.5-3). Schools in the district are operating below capacity. A total of 314, or 6.3 percent, of the students in the district are dependents of site-related (direct and secondary) personnel. In fall 1992, dependents of military, direct, and secondary civilian personnel accounted for 314 of the district's enrollment of 5,015 (see Table 3.5-4). Approximately 173 students were dependents of K. I. Sawyer AFB military and civilian personnel and 141 were estimated as being secondary enrollment.

Colleges and Universities. NMU is the principal institution of higher education in the region. NMU is a 4-year state university with approximately 8,600 students and 340 faculty. Established in 1899 as a teacher's college, NMU was granted university status in 1963 and operates off-campus programs at several locations including K. I. Sawyer AFB, the Dickinson-Iron County Center, and the Marquette Branch Prison. Approximately 300 military and their dependents, and civilians utilize the facilities at the base.

Closure Conditions

Potential migratory-related effects to public school enrollment and teaching staff due to base closure are presented in Table 3.5-5. By closure, the migratory-related enrollment in the Gwinn Area Community Schools due to base operations would decline from 1,684 students in 1992 to 0 students at closure. This would reduce total enrollment in the Gwinn Area Community Schools from 2,984 students to 1,300 students, a 56.4 percent decrease in enrollment. In the Marquette Area Public Schools migratory-related enrollment would decline from 167 students to 0 students by closure. Enrollment would drop from 5,015 in 1992 to 4,848 at closure, a 3.3-percent decrease in enrollment.

Corresponding reductions in migratory-related demand for teachers and facilities use would be expected to accompany these projected enrollment decreases (see Table 3.5-5). Assuming no other changes in staffing due to non-base-related growth, the number of teachers needed to maintain the 1992 student/teacher ratio in the Gwinn Area Community Schools would fall from 184 in 1992 to 80 at closure. In the Marquette Area Public Schools, the number of teachers required would be reduced from 238 in 1992 to 230 at closure. These staffing changes are based on fall 1992 student/teacher

Table 3.5-5. Migratory-Related Enrollment and Teaching Staff Effects, 1992 to Closure

	1992	1993	1994	Closure[a]
Student Enrollment Effects				
Gwinn Area Community Schools	1,684	1,504	1,254	0
Marquette Area Public Schools	167	148	124	0
Total	1,851	1,652	1,378	0
Teaching Staff Effects				
Gwinn Area Community Schools	104	93	77	0
Marquette Area Public Schools	8	7	6	0
Total	112	100	83	0

Notes: Effects of migratory-related population changes on student enrollments and teaching staff requirements.
(a) Closure represents September 1995 conditions.

ratios applied to changes in total enrollment, and do not account for distribution of effects for individual grade levels or other changes in enrollment.

3.5.3 Police Protection

Recent Trends

Police protection is provided by the Michigan State Police, the Marquette County Sheriff's Department, the Forsyth Township Police Department, the city of Marquette, and the base security force. Sands and West Branch townships do not have their own police departments and rely on Marquette County for police protection. The Marquette County Sheriff's Department operates the county jail, which is utilized by all law enforcement agencies in the county. Emergency dispatching for all police departments is provided by Marquette County Central Dispatch.

Michigan State Police. The Michigan State Police have statewide jurisdiction to provide law enforcement and police protection services. The Michigan State Police serve Marquette County from one post located in Negaunee, which has concurrent jurisdiction with the Marquette County Sheriff to provide primary police protection to those areas of the county that do not have a police department, although there are no formal mutual aid agreements with other agencies in the region. In 1992, 17 troopers were assigned to the Negaunee Post for a level of service of 0.3 trooper per 1,000 persons, or an area-generated level of service of 0.01 trooper per square mile. The post is assigned seven marked vehicles and one unmarked vehicle, and has a canine (K-9) unit trained for search and drug functions.

In addition to the troopers, a command staff of eight support the Michigan State Police District Headquarters located here. The command staff also supervise the State Police regional dispatch service for the Upper Peninsula region. The regional dispatch operates in conjunction with Marquette County Central Dispatch (Van Oosterhout, 1994).

Marquette County Sheriff's Department. The Marquette County Sheriff's Department provides law enforcement and police protection services to the entire county except for the on-base property. The department operates out of the main sheriff's office located in the city of Marquette, with a staff of 15 sworn officers. The county sheriff's 1992 level of service was 0.2 officer per 1,000 persons, or an area-generated service level of 0.01 officer per square mile. The sheriff's department is equipped with eight marked and four unmarked cars. The sheriff's department also manages the county jail facility, which employed 18 people in 1992. The jail facility, located in the city of Marquette, has a capacity of 80 inmates and operated at 68 percent capacity in 1992.

The sheriff's department maintains mutual aid agreements with all other police agencies within the county under the Marquette County Reciprocal Law Enforcement Aid Agreement, including the Forsyth Township Police Department, the city of Marquette Police Department, and the K. I. Sawyer AFB Security Police (Maino, 1994).

Forsyth Township Police Department. The Forsyth Township Police Department provides police protection within Forsyth Township. With seven sworn officers, the department maintained a 1992 level of service of 1.3 police officers per 1,000 persons, or an area-generated service level of 0.04 officer per square mile. The department operates out of a station located in Gwinn, and owns three marked patrol vehicles and two unmarked vehicles. The Forsyth Township Police Department participates with all other law enforcement agencies in the county (Forsyth Township Police Department, 1993).

City of Marquette Police Department. The Marquette Police Department provides law enforcement and police protection services within the city of Marquette. The department operates out of one police station with a staff that includes 34 full-time officers. The city's level of service for police protection in 1992 was 1.5 sworn officers per 1,000 persons. The department utilizes 12 cars (marked and unmarked). The Marquette Police Department maintains mutual aid agreements with all other police departments in the county (Johnson, 1994).

410th Security Police Squadron. Law enforcement and security within the boundaries of K. I. Sawyer AFB are provided by the 410th Security Police Squadron. The squadron's functions include security for the 410th Bomb Wing located on base. In 1992, the squadron was staffed by 371

personnel, 352 of whom were equivalent to sworn law enforcement officers. The squadron operates from one station on the base with 39 vehicles, including patrol cars, 4x4 vehicles, armored vehicles, and two buses. The squadron has one holding facility with a 14-bed capacity. The security police maintain a policy of cooperation with all local law enforcement agencies, and the squadron is a member of the countywide mutual aid agreement.

Closure Conditions

Projected effects on police protection in the ROI resulting from base closure are presented in Table 3.5-6. Changes in demand for police protection services reflect the pattern of migratory-related population changes in the region. The staffing level of the Michigan State Police could be reduced by two troopers and maintain the 1992 level of service. The Marquette County Sheriff's Department could reduce the number of officers by one, the Forsyth Township Police Department could reduce its force by one, and the city of Marquette Police Department could reduce its force by one and maintain 1992 service levels. In some cases, the local jurisdictions may maintain the same staff level for a higher level-of-service ratio.

Table 3.5-6. Migratory-Related Demand for Police Officers, 1992 to Closure

	1992	1993	1994	Closure[a]
Michigan State Police	2	1	1	0
Marquette County Sheriff's Department	1	1	1	0
Forsyth Township Police Department	3	3	2	0
City of Marquette Police Department	1	1	1	0
Total	7	6	5	0

Notes: Table shows the effects of migratory-related population changes on the number of required sworn officers. Data are rounded to the nearest whole police officer, except in the closure column.
(a) Closure represents September 1995 conditions.

Assuming no other changes in staffing, these reductions would decrease police agency staffing levels at closure to 15 for the Negaunee post, 14 for Marquette County, 4 for Forsyth Township, and 33 for the city of Marquette. With the closure of the base, the 410th Security Police Squadron would no longer provide police protection for the base area, which, with the housing area, would remain fenced with site security maintained by the OL. Therefore, no additional sheriff's deputies or police

officers are anticipated to be required to provide police protection services to the base area.

The Marquette County Sheriff's Department and the Forsyth Township Police Department would supplement the OL security force as necessary for law enforcement on the site.

3.5.4 Fire Protection

Recent Trends

Fire protection in the ROI is provided by the Forsyth, Sands, and Skandia-West Branch township fire departments, as well as by the City of Marquette Fire Department and the K. I. Sawyer AFB Fire Department. The township fire departments are volunteer departments with on-call personnel, whereas the City of Marquette Fire Department is staffed by full-time professional fire fighters. Each fire department maintains specific mutual aid agreements and cooperates with others in the region during emergencies. All fire departments in Marquette County are members of the Marquette County Fire Fighters Association. Emergency dispatching for all county fire departments is provided by Marquette County Central Dispatch.

Forsyth Township Fire Department. The Forsyth Township Fire Department is a rural volunteer fire department that provides fire protection and emergency medical services in Forsyth Township. The department had 30 volunteer fire fighters and 9 volunteer emergency medical technicians (EMTs) in 1992. Considering the volunteers as full-time fire fighters, the population service level is 5.8 fire fighters per 1,000 persons, and the service area ratio is 0.17 fire fighter per square mile. The department operates two Class-A pumpers, one quick-response vehicle, an 1,800-gallon tanker, and an ambulance from one fire station in Gwinn.

The department maintains five mutual aid agreements with surrounding jurisdictions: Sands, Skandia-West Branch, Wells, and Richmond township fire departments and K. I. Sawyer AFB. The Forsyth Township Fire Department receives approximately five requests for fire protection or ambulance service per year from mutual aid partners (Forsyth Township, 1993).

Sands Township Fire Department. Fire protection and emergency medical service in Sands Township are provided by the Sands Township Fire Department. The department has one fire hall centrally located in the 72-square-mile township and one fire hall near the northern border. In 1992, 33 volunteer fire fighters provided a level of service of 17.8 fire fighters per 1,000 persons, with a service area ratio of 0.49 fire fighter per square mile. Fire fighting equipment consists of two pumper trucks, four tanker trucks, a front-end loader, and a crash truck. With one ambulance,

ten volunteer EMTs provide basic life support emergency service for the township.

The Sands Township Fire Department has joined with fire departments from five other jurisdictions (Chocolay Township, Marquette Township, Forsyth Township, the city of Marquette, and K. I. Sawyer AFB) in mutual aid agreements (Yelle, 1993).

Skandia-West Branch Fire Department. The Skandia-West Branch Fire Department serves a 108-square-mile area comprising West Branch and Skandia townships. The department has a total of 20 volunteer fire fighters. The department also has 14 volunteers trained to render a first-responder level of emergency medical service. The fire department maintains a level of service of 10.6 fire fighters per 1,000 persons (for the estimated 1,885 population living off base in these two areas) and a service area ratio of 0.19 fire fighter per square mile for the 107-square-mile area. The department has one fire station, which houses a 1,000-gallon-per-minute fire truck, a pumper, and an ambulance. The Skandia-West Branch Fire Department is involved in mutual aid agreements with several township fire departments, including Forsyth Township and the K. I. Sawyer AFB Fire Department.

City of Marquette Fire Department. The city of Marquette Fire Department provides fire protection within the city. The department employed 23 full-time professional fire fighters in 1992, and maintained a level of service of 1.0 fire fighter per 1,000 persons in the city. The department operates three 1,000-gallon pumpers, one snorkel, one rescue truck, and three additional vehicles from two stations. The department maintains mutual aid agreements with the K. I. Sawyer AFB Fire Department, and the fire departments of Marquette, Sands, and Chocolay townships. For emergency medical services, the city relies on Marquette General Hospital (Johnson, 1994).

410th Civil Engineering Squadron. The Fire Protection Flight provides fire protection services for the base area with 65 fire fighting personnel (50 military and 15 civilian). Eight base fire fighters are also volunteers in local township fire departments (five in Forsyth and three in Sands). The squadron operates out of 1 fire station with 17 pieces of major equipment. The base fire department is a partner in 15 mutual aid agreements with local fire departments.

Closure Conditions

Potential effects of base closure on fire protection services in the ROI are presented in Table 3.5-7. Changes in demand for fire protection services would decrease by 13 volunteer fire fighters in the Forsyth Township Fire Department. The Sands Township Fire Department would decrease by eight

Table 3.5-7. Migratory-Related Demand for Fire Fighters, 1992 to Closure

	1992	1993	1994	Closure[a]
Forsyth Township	13	12	10	0
Sands Township	8	8	7	0
Skandia-West Branch Township	4	3	3	0
City of Marquette	1	1	1	0
Total	26	24	21	0

Notes: The table shows the effects of migratory-related population changes on the number of fire fighters required to maintain level-of-service ratios. Data are rounded to the nearest whole fire fighter, except in the closure column.
(a) Closure represents September 1995 conditions.

and the Skandia-West Branch Fire Department would decrease by four. The staff of the City of Marquette Fire Department may decline by one fire fighter. Some of the reductions in fire fighters for Forsyth and Sands townships may not be necessary because military personnel are part of the volunteer fire fighting staff. These military personnel may be out-migrating from the area. In some cases, the local jurisdictions may maintain the same staff level, thus resulting in a higher level-of-service ratio.

Assuming no other changes in staffing, these reductions would decrease fire department staffing levels at closure to 17 for Forsyth Township, 25 for Sands Township, 16 for Skandia-West Branch, and 22 for the city of Marquette. Upon closure of the base, with K. I. Sawyer AFB in caretaker status, the K. I. Sawyer AFB Fire Department would no longer provide fire protection services. Local fire departments would not be able to rely on mutual aid assistance from the base fire department for fire protection, fire suppression, rescue, or hazardous materials response. At closure, an OL fire protection team would operate an interim fire department at the base. The Forsyth, Sands, and Skandia-West Branch township fire departments would provide mutual aid support.

3.5.5 Health Care

Recent Trends

Two acute and general care hospitals are licensed to provide health care services within Marquette County; these facilities contain more than 350 inpatient beds (Michigan Department of Public Health, 1993). In 1993, there were 175 physicians, 47 dentists, 939 registered nurses (RNs), and 553 licensed practical nurses in Marquette County (Stipcak, 1994). Physicians and RNs in Marquette County provided service levels of 2.6 physicians and 14 RNs per 1,000 persons compared to state averages of 2.3 physicians and 9.5 RNs per 1,000 persons in 1993.

Community Health Care Services. The largest health care provider in the ROI is the City of Marquette General Hospital. The hospital is licensed for 289 beds and operates at 60 to 65 percent capacity. The hospital provides basic primary and acute medical care, along with general and specialized medical and surgical services, outpatient and ambulatory care, and emergency and trauma care. Mental health services are available from a 60-bed psychiatric unit. The ambulance service based at the hospital has advanced life support capability. It is equipped with three ambulances and is staffed by paramedics and emergency medical technicians (Nemacheck, 1993).

The other acute care hospital in Marquette County is the Francis A. Bell Memorial Hospital located in Ishpeming. Bell Memorial is licensed for 69 beds and provides medical, surgical, obstetrical, and pediatric inpatient services. Laboratory services, radiology, physical/respiratory therapy, and other services are available through the hospital's walk-in clinic. Ambulance service is provided by the Ishpeming Fire Department.

Military Health Care Services. K. I. Sawyer AFB operates a hospital that provides inpatient and outpatient health care services to active duty military personnel and their dependents, to retired military personnel and their dependents, and to dependents of deceased military personnel. Patient services at the K. I. Sawyer AFB hospital include primary care, general dentistry, emergency services, and other related services.

The closest Air Force installations where medical care is available to active duty personnel and to retired military personnel and dependents are the Wright-Patterson Medical Center in Dayton, Ohio, approximately 900 driving miles; and the Grand Forks AFB Hospital in Grand Forks, North Dakota, approximately 500 driving miles from K. I. Sawyer AFB. The Great Lakes Naval Station Hospital in Chicago, Illinois, is the closest other DOD facility, approximately 400 driving miles. The nearest Veterans Administration (VA) hospital is the VA Medical Center located in the city of Iron Mountain, Michigan, approximately 100 driving miles.

In addition to military health services offered through the base hospital, military personnel and dependents have access to the Tri-Care program (previously known as Civilian Health and Medical Program of the Uniformed Services [CHAMPUS]). Three different levels of care are available: Tri-Care Prime, a co-payment arrangement using a carefinder network; Tri-Care Extra, similar to Tri-Care Prime except that patients may choose their own physician; and Tri-Care CHAMPUS, similar to the original CHAMPUS program. Tri-Care CHAMPUS is a co-payment medical plan with an annual deductible, which provides payment for specific medical services to eligible dependents of active, retired, or deceased military personnel. Active duty military personnel are covered by the program for medical services not available at their base, or for emergencies. As with many insurance plans,

Tri-Care CHAMPUS pays approximately 75 percent of the set rate for a given medical service. Tri-Care is honored by hospitals, clinics, and doctors nationwide, including the health care facilities mentioned in this report. Because of limitations and constraints to the coverage offered by Tri-Care, retired military personnel are encouraged to supplement this health care plan with secondary coverage.

Closure Conditions

The closure of the K. I. Sawyer AFB hospital occurred in two stages. On April 1, 1995, the hospital was reduced to a clinic. Further reduction occurred on July 1, 1995, as the site became a first aid station through closure. The two acute care hospitals and health care facilities located within the ROI would be adequate to provide health services as required by the residents of the ROI. Those most affected by the closure of the hospital will be the retirees and associated dependents projected to remain in the region. The hospital at the Great Lakes Naval Station is the nearest military facility where they could obtain free medical services. Veterans will continue to have access to the VA Medical Center in Iron Mountain. The 410th Medical Group at K. I. Sawyer AFB is working with a private contractor to set up a referral network to help retirees and dependents find appropriate care in the local area following closure.

3.6 PUBLIC FINANCE

The ROI for public finance is defined as Marquette County, Forsyth Township, Sands Township, West Branch Township, the city of Marquette, the Gwinn Area Community Schools, and the Marquette Area Public Schools. Recent trends are discussed first and are followed by discussion of the effects of base closure.

In December 1993, the Michigan legislature passed and the governor signed legislation that changed the way local school districts would be financed in the state. Effective in FY 1994/1995, local property taxes may no longer be levied to support local school district operating and maintenance functions. Under this legislation, the state assumes responsibility for providing funding for basic educational programs at the local level with minimum funding guaranteed at $4,200 per pupil. Two proposals for funding this change are being considered. A ballot measure, approved in March 1994, raised the statewide sales tax from 4 to 6 percent; set a statewide property tax rate for residential property at 6 mills and nonresidential property at 24 mills; increased tobacco taxes; set a statewide 4 percent property transfer tax; increased business taxes by 1 percent; and reduced personal income tax rates by 0.2 percent (Michigan Association of School Administrators, 1993; Yeadon, 1994).

3.6.1 Marquette County

Recent Trends

Services provided by Marquette County are funded principally through the county's general and special revenue funds. In FY 1992, revenues and expenditures of these funds were $32,837,109 and $33,416,151, respectively. Fund balances were $4,689,986, or 14.0 percent of operating expenditures (Table 3.6-1). This was a decrease from FY 1990, when fund balances were $5,043,618, or 17.7 percent of operating expenditures.

Table 3.6-1. Marquette County Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, Fiscal Years 1990-1992 (current dollars)

	1990	1991	1992
Revenues			
Taxes	6,053,883	6,405,979	6,612,188
Licenses and Permits	303,902	238,813	352,686
Federal Sources	2,020,091	1,388,536	2,105,221
State Sources	12,548,753	17,213,358	18,669,807
Charges for Service	5,093,280	2,960,160	3,746,364
Other	1,535,596	1,666,363	1,350,843
Total	27,555,505	29,873,209	32,837,109
Expenditures			
General Government	4,955,215	5,077,295	5,284,877
Law Enforcement	2,639,846	3,104,809	3,244,823
Human Services	11,841,374	13,463,157	15,027,313
Resource Management	1,054,223	1,102,687	1,298,175
Community Development	6,719,436	5,987,996	7,396,531
Capital Outlay	261,360	189,074	200,312
Other	953,545	855,412	964,120
Total	28,424,999	29,780,430	33,416,151
Fund Balances[a]	5,043,618	5,431,823	4,689,986

Notes: Marquette County fiscal year is January 1 through December 31.
(a) Includes interfund transfers to and from funds other than general and special revenue funds; thus fund balances will not total.

Sources: Anderson, Tackman & Company, 1991, 1992, 1993.

The principal revenue sources of the county are from the state (56.9 percent of total FY 1992 collections) and taxes (20.1 percent).

The principal expenditure functions of the county are for human services (45.0 percent of total FY 1992 expenditures), community development (22.1 percent), and general government services (15.8 percent).

Assessed valuation in the county is approximately $731.0 million. The county had approximately $13.8 million in outstanding general obligation bond indebtedness at the end of FY 1992.

Closure Conditions

Reduced site-related earnings, lower employment, and out-migration of 11,176 residents from 1992 levels are projected to result in reductions in general and special fund revenues of $3,684,895 by closure. Lower state source revenues ($2,573,498) and charges for services ($630,885) account for 87.0 percent of the lost revenue.

Losses in revenue would be partially offset by a reduction in expenditures of $2,080,882. The net fiscal effect of closure would be a revenue shortfall of $1,604,013 annually (Table 3.6-2). Increases in local tax and non-tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

Table 3.6-2. Net Fiscal Effects of Closure of K. I. Sawyer AFB on Potentially Affected Local Government Units, Fiscal Years 1992 to Closure (1992 dollars)

Jurisdiction	1992	1993	1994	Closure
Marquette County	0	-154,574	-386,507	-1,604,013
Forsyth Township	0	-4,965	-12,770	-52,587
Sands Township	0	-3,998	-10,069	-41,165
West Branch Township	0	-6,420	-15,282	-60,220
City of Marquette	0	-5,517	-13,613	-59,126
Gwinn Area Community Schools	0	-274,195	-655,021	-2,565,245
Marquette Area Public Schools	0	-12,659	-28,649	-111,264

Note: Data reflect the difference in projected revenue losses less expenditure reductions. These effects are cumulative.

3.6.2 Forsyth Township

Recent Trends

Services provided by Forsyth Township are funded principally through the township's general and special revenue funds. In FY 1992, revenues and

expenditures of these funds were $1,159,241 and $1,222,121, respectively. Fund balances were $513,592, or 42.0 percent of operating expenditures (Table 3.6-3). This was a decrease from FY 1990, when fund balances were $630,168, or 44.3 percent of operating expenditures.

Table 3.6-3. Forsyth Township Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Property Taxes	485,233	518,078	459,717
Licenses and Permits	3,983	4,109	5,017
State Transfers	630,936	595,461	587,063
Charges for Service	134,085	43,007	43,385
Fines and Forfeits	12,103	15,006	18,931
Other	132,949	41,079	45,128
Total	1,399,289	1,216,740	1,159,241
Expenditures			
General Government	281,426	274,040	282,993
Public Safety	351,016	367,715	375,770
Public Works	156,750	121,596	119,972
Sanitation	107,254	16,626	28,582
Recreation and Culture	192,715	203,156	178,118
Other	334,285	282,610	236,686
Total	1,423,446	1,265,743	1,222,121
Fund Balances[a]	630,168	571,668	513,592

Notes: Forsyth Township fiscal year is April 1 through March 31.
(a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Kroncich & Associates, 1991a, 1991b, 1992a, 1992b, 1993a, 1993b.

The principal revenue sources of the township are state sources (50.6 percent of total FY 1992 collections) and property taxes (39.7 percent).

The principal expenditures of the township are for public safety services (30.7 percent of total FY 1992 expenditures) and general government (23.2 percent).

Assessed valuation in the township is approximately $53.5 million. The township had approximately $208,000 in general obligation bond indebtedness outstanding at the end of FY 1992.

Closure Conditions

Reduced site-related earnings, lower employment, and out-migration of approximately 6,039 residents from 1992 levels are projected to result in reductions in general and special fund revenues of $513,557 by closure. Lower state source revenues ($422,247) and charges for services ($51,815) account for 92.3 percent of the lost revenues.

Losses in revenue would be partially offset by a reduction in expenditures of about $460,770. The net fiscal effect of closure would be a revenue shortfall of $52,587 annually (see Table 3.6-2).

Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

3.6.3 Sands Township

Recent Trends

Services provided by Sands Township are funded principally through the township's general and special revenue funds. In FY 1992, revenues and expenditures of these funds were $357,749 and $275,696, respectively. Fund balances were $301,356, or 109.3 percent of operating expenditures (Table 3.6-4). This compares to FY 1990, when fund balances were $212,740, or 67.9 percent of operating expenditures.

The principal revenue sources of the township are state-shared revenue (43.0 percent of total FY 1992 collections) and property taxes (28.2 percent).

The principal expenditure functions of the township are for general government (43.7 percent of total FY 1992 expenditures) and sanitation services (27.8 percent).

Assessed valuation in the township is approximately $21.4 million. The township had no general obligation bond indebtedness at the end of FY 1992.

Closure Conditions

Reduced site-related earnings, lower employment, and out-migration of 1,390 residents from 1992 levels are projected to result in reductions in general and special fund revenues of $109,873 by closure. Lower state source revenues ($71,238), and permit and fee revenues ($27,300) account for 89.7 percent of the lost revenue.

Table 3.6-4. Sands Township Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Property Taxes	87,332	89,218	100,882
State Shared Revenues	134,992	164,019	153,854
Permits and Fees	56,489	58,248	58,638
Charges for Service	5,620	7,254	23,011
Other	26,753	24,543	21,364
Total	311,186	343,282	357,749
Expenditures			
General Government	98,739	81,492	120,356
Fire Department	24,932	21,869	25,374
Public Works	14,064	15,032	5,736
Sanitation	124,141	56,069	76,613
Ambulance	10,506	11,694	37,180
Other	41,132	71,870	10,437
Total	313,514	258,026	275,696
Fund Balances[a]	212,740	304,762	301,356

Notes: Sands Township fiscal year is April 1 through March 31.
(a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Steven M. Foulks, CPA, 1991, 1992, 1993.

Losses in revenue would be partially offset by a reduction in expenditures of $68,708. The net fiscal effect of closure would be a revenue shortfall of $41,165 annually (see Table 3.6-2).

Increases in local tax and non-tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

3.6.4 West Branch Township

Recent Trends

Services provided by West Branch Township are funded principally through the township's general fund. In FY 1992, revenues and expenditures of this fund were $133,532 and $118,106, respectively. Fund balances were $249,317, or 211.1 percent of operating expenditures (Table 3.6-5). This compares to FY 1990, when fund balances were $221,354, or 65.3 percent of operating expenditures.

Table 3.6-5. West Branch Township Revenues, Expenditures, and Fund Balances, General Fund, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Property Taxes	13,106	12,835	13,719
State Transfers	299,597	109,706	109,652
Charges for Service	2,257	1,659	1,709
Other	18,690	12,578	8,452
Total	333,650	136,778	133,532
Expenditures			
General Government	50,134	56,873	59,702
Public Safety	19,720	23,111	20,239
Public Works	7,297	9,712	9,138
Health and Welfare	257,274	20,837	22,382
Recreation	4,675	9,708	6,645
Total	339,100	120,241	118,106
Fund Balances[a]	221,354	235,891	249,317

Notes: West Branch Township fiscal year is April 1 through March 31.
(a) Includes interfund transfers to and from funds other than general fund; thus, fund balances will not total.

Sources: Sarah Davis, CPA, 1991, 1992, 1993.

The principal revenue sources of the township are state-shared revenue (82.1 percent of total FY 1992 collections) and property taxes (10.3 percent).

The principal expenditures of the township are for general government (50.5 percent of total FY 1992 expenditures) and health and welfare services (19.0 percent).

Assessed valuation in the township is approximately $9.2 million. The township had approximately $27,000 in outstanding general obligation bond indebtedness at the end of FY 1992.

Closure Conditions

Reduced site-related earnings, lower employment, and out-migration of approximately 1,726 residents from 1992 levels are projected to result in reductions in general and special fund revenues of $87,396 by closure. Lower state source revenue ($82,192) accounts for 94.0 percent of the lost revenue.

Losses in revenue would be partially offset by a reduction in expenditures of about $27,176. The net fiscal effect of closure would be a revenue shortfall of $60,220 annually (see Table 3.6-2).

Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

3.6.5 City of Marquette

Recent Trends

Services provided by the city of Marquette are funded principally through the city's general and special revenue funds. In FY 1992, revenues and expenditures of these funds were $14,554,162 and $15,191,358, respectively. Fund balances were $5,495,189, or 36.2 percent of operating expenditures (Table 3.6-6). By comparison, in FY 1990, fund balances were $5,146,826, or 32.2 percent of operating expenditures.

The principal revenue sources of the city are property taxes (29.0 percent of total FY 1992 collections) and state sources (21.2 percent).

The principal expenditures of the city are for general government (19.5 percent of total FY 1992 expenditures) and public health and safety services (16.9 percent).

Assessed valuation in the city is approximately $282.7 million. The city had no outstanding general obligation bond indebtedness at the end of FY 1992.

Closure Conditions

Reduced site-related earnings, lower employment, and out-migration of approximately 986 residents from 1992 levels are projected to result in reductions in general and special fund revenues of approximately $327,372 by closure. Lower state source revenues ($157,583) and charges for services ($88,415) account for 75.1 percent of the lost revenue.

Losses in revenue would be partially offset by a reduction in expenditures of about $268,246. The net fiscal effect of closure would be a revenue shortfall of $59,126 annually (see Table 3.6-2).

Increases in local tax revenue schedules and/or lower service levels may be required to maintain a balanced fiscal position at closure.

Table 3.6-6. City of Marquette Revenues, Expenditures, and Fund Balances, General and Special Revenue Funds, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Property Taxes	3,940,280	4,034,071	4,225,076
In-Lieu Taxes	2,053,775	2,115,248	2,144,336
State Transfers	3,197,131	4,077,556	3,091,314
Federal Sources	51,280	103,057	71,195
County Transfers	63,567	23,014	25,764
Licenses and Permits	8,460	7,468	12,334
Charges for Services Sales	1,946,730	1,838,268	2,030,472
	208,513	240,493	215,714
Use and Admission Fees	445,240	541,256	465,555
Fines and Forfeits	151,935	177,059	209,963
Other	1,831,801	2,103,761	2,062,439
Total	13,898,712	15,261,251	14,554,162
Expenditures			
General Government	2,693,354	3,171,119	2,958,650
Public Health and Safety	2,228,433	2,355,963	2,572,928
Public Works	1,765,104	1,842,998	1,788,519
Sanitation	1,721,488	1,559,300	1,719,732
Social Services	116,106	132,894	136,221
Recreation and Culture	1,554,652	2,014,833	1,885,678
Highways, Streets, and Bridges	2,619,897	1,906,449	2,183,456
Capital Outlay	2,730,662	740,272	1,339,715
Debt Service	539,742	558,653	606,459
Total	15,969,438	14,282,481	15,191,358
Fund Balances[a]	5,146,826	6,165,814	5,495,189

Notes: City of Marquette fiscal year is July 1 through June 30.
(a) Includes interfund transfers to and from funds other than general and special revenue funds; thus, fund balances will not total.

Sources: Marquette, City of, 1990, 1991, 1992.

3.6.6 Gwinn Area Community Schools

Recent Trends

Services provided by the Gwinn Area Community Schools are funded principally through the district's general fund. In FY 1992, revenues and expenditures of this fund were $13,407,568 and $13,411,444, respectively. Fund balances were $2,236,166, or 16.7 percent of operating expenditures (Table 3.6-7). This compares to FY 1990, when fund balances were $2,230,379, or 20.0 percent of operating expenditures.

Table 3.6-7. Gwinn Area Community Schools Revenues, Expenditures, and Fund Balances, General Fund, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Local Sources	2,455,956	2,588,044	2,649,584
State Sources	6,461,754	7,045,733	7,254,084
Federal Sources	3,241,451	3,026,147	3,145,157
Other	163,591	116,854	358,743
Total	12,322,752	12,776,778	13,407,568
Expenditures			
Instruction	6,857,629	7,604,471	8,355,206
Support Services	3,939,929	4,236,494	4,649,822
Community Services	35,757	42,575	43,867
Capital Outlay	283,354	352,124	353,629
Debt Service	61,660	8,920	8,920
Total	11,178,329	12,244,584	13,411,444
Fund Balances[a]	2,230,379	2,552,575	2,236,166

Notes: Gwinn Area Community Schools fiscal year is July 1 through June 30.
(a) Includes interfund transfers to and from funds other than general fund; thus, fund balances will not total.

Sources: Kroncich & Associates, 1991a, 1991b, 1992a, 1992b, 1993a, 1993b.

State revenue accounts for the majority of general fund revenues (54.1 percent of FY 1992 revenues). P.L. 81-874 program revenues were $2,624,673 in FY 1992. Local source revenue (principally property taxes) and other federal aid programs account for the remaining revenue sources.

The principal expenditure of the district is for direct instruction (62.3 percent of total FY 1992 expenditures). Support services (administration and

physical plant maintenance and operation) and other miscellaneous items account for the remaining expenditures.

Closure Conditions

A reduction in enrollment of 1,684 students will result in reduced general fund revenues of $8,410,409 by closure. Revenue losses would include a reduction of $5,340,722 in state source and local property tax revenues as a result of migratory-related enrollment decreases, and a loss of $2,624,673 in P.L. 81-874 program revenues.

These losses could be partially offset by reductions in expenditures of $5,845,164. The net fiscal effect of closure would be a revenue shortfall of $2,565,245 annually. Reductions in service levels and/or increases in other revenue sources would be required to maintain a balanced fiscal position.

The estimates of revenue losses are based on historic funding patterns prior to the announcement of the closure of the base and prior to implementation of the financing reform measures discussed above. These funding reform changes are not expected to materially affect the projection of the revenue losses (Gwinn Area Community Schools, 1993).

3.6.7 Marquette Area Public Schools

Recent Trends

Services provided by the Marquette Area Public Schools are funded principally through the district's general fund. In FY 1992, revenues and expenditures of this fund were $21,129,223 and $20,741,384, respectively (Table 3.6-8). Fund balances were $1,465,361, representing 7.1 percent of operating expenditures in this year. This compares to FY 1990 when fund balances were $1,439,298, or 7.6 percent of operating expenditures.

Local sources (principally property taxes) are the leading source of general fund revenues (63.8 percent of FY 1992 revenues), while state source revenues (30.3 percent) and other miscellaneous sources account for the remaining portion. The district does not receive P.L. 81-874 program revenues.

The principal expenditure by the district is for direct instruction (69.4 percent of FY 1992 expenditures). Support services (administration and physical plant maintenance and operation) and other miscellaneous expenditures account for the remaining expenditures.

Table 3.6-8. Marquette Area Public Schools Revenues, Expenditures, and Fund Balances, General Fund, Fiscal Years 1990/1991-1992/1993 (current dollars)

	1990/1991	1991/1992	1992/1993
Revenues			
Local Sources	13,104,768	13,740,061	13,476,388
State Sources	4,934,124	5,624,088	6,393,209
Federal Sources	413,021	402,943	665,688
Other	170,377	429,493	593,938
Total	18,622,290	20,196,585	21,129,223
Expenditures			
Instruction	12,128,366	13,034,210	14,390,774
Support Services	6,025,210	6,211,394	5,936,188
Community Services	81,481	87,288	94,597
Capital Outlay	504,850	436,094	192,065
Debt Service	223,850	237,706	127,760
Total	18,963,757	20,006,692	20,741,384
Fund Balances[a]	1,439,298	1,391,373	1,465,361

Notes: Marquette Area Public Schools fiscal year is July 1 through June 30.
(a) Includes interfund transfers to and from funds other than general fund; thus, fund balances will not total.

Source: Marquette Area Public Schools, 1993.

Closure Conditions

A reduction in enrollment of 167 students will result in reduced general fund revenues of $671,514 by closure. This will include a reduction of $456,488 in state source revenues (the principal revenue source affected) as a result of migratory-related enrollment decreases.

These losses could be partially offset by reductions in expenditures of $560,250. The net fiscal effect of closure would be a revenue shortfall of $111,264 annually. Reductions in service levels and/or increases in other revenue sources may be required to maintain a balanced fiscal position.

3.7 TRANSPORTATION

This section addresses preclosure and closure conditions of roadways, air transportation, and other modes of transportation. The ROI for transportation includes the local communities of Marquette, Gwinn, Skandia, and Little Lake, with emphasis on the immediate area surrounding K. I. Sawyer AFB. A more detailed discussion of transportation is presented in

Section 3.2.3 of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan.

3.7.1 Roadways

Recent Trends

Regional access to K. I. Sawyer AFB is indirectly provided by SH 28 and U.S. 41. SH 28 provides regional access between Sault Ste. Marie, 140 miles to the east, and Marquette. Marquette, located 20 miles north of the base, is the major population center in this region. U.S. 41 connects Marquette to Escanaba, Michigan, 60 miles to the south. Figures 3.7-1 and 3.7-2 show the local transportation system and on-base roads. SH 35 connects the community of Gwinn, south of the base, to the cities of Negaunee and Escanaba.

The following roads have been identified as the most important in providing access to the base area:

- U.S. 41, a principal north-south corridor, is a two-lane, undivided highway, which connects the cities of Marquette and Escanaba.

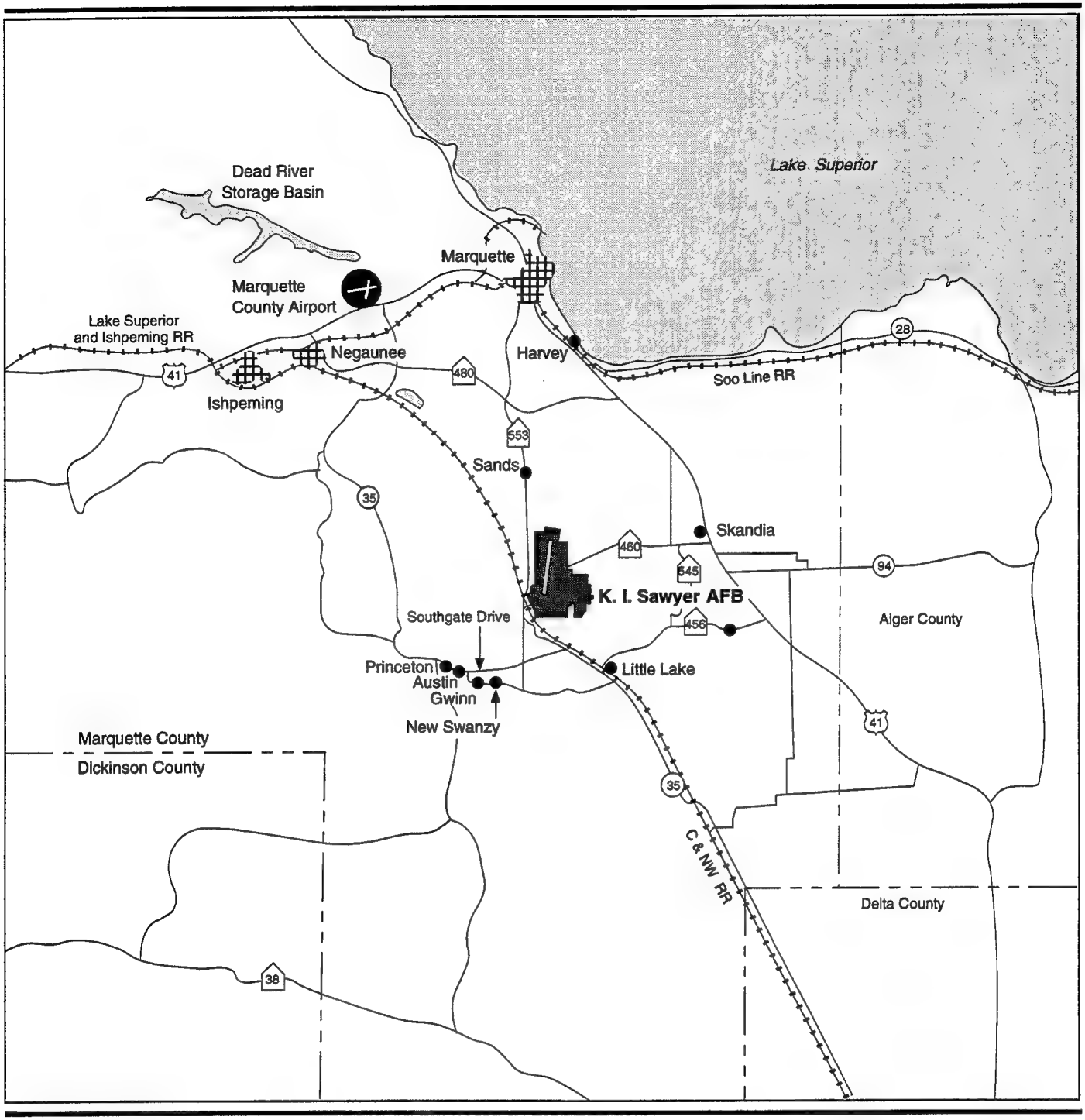
- CR 553, a two-lane, undivided roadway, connects SH 35 in Gwinn to the city of Marquette.

Other key roads in the ROI include CR 456, which connects SH 35 and the community of Little Lake to U.S. 41, and CR 545, a north-south road just east of the base, connecting CR 460 to CR 456. CR 480 connects U.S. 41 to the city of Negaunee through CR 553 just south of Marquette and 10 miles north of the base.

Access to K. I. Sawyer AFB is through three gates. Gate 1 (the Main Gate) is accessed from CR 462, which intersects CR 553 approximately 0.5 mile west of the gate. Gate 2 is accessed from CR 460, which connects to U.S. 41 just south of the community of Skandia. Gate 3, which serves the base housing area, is seldom used, and access is from Sporley Lake Road. Gates 1 and 2 are open 24 hours, and Gate 3 is open from 6:30 to 12:30 a.m.

Preclosure (1992) and closure (1995) traffic levels on key roads in the vicinity are summarized in Table 3.7-1. The table shows hourly capacity, peak-hour traffic volumes, and corresponding Level of Service (LOS).

All of the roadways in the ROI experience a LOS of C or better. The segment with the most congestion is CR 553 south of the city of Marquette. This section, together with CR 480 west of the intersection with CR 553, carries most of the heavy truck volume. These trucks haul iron ore from the mines west of the city of Marquette to the harbor and return with crushed



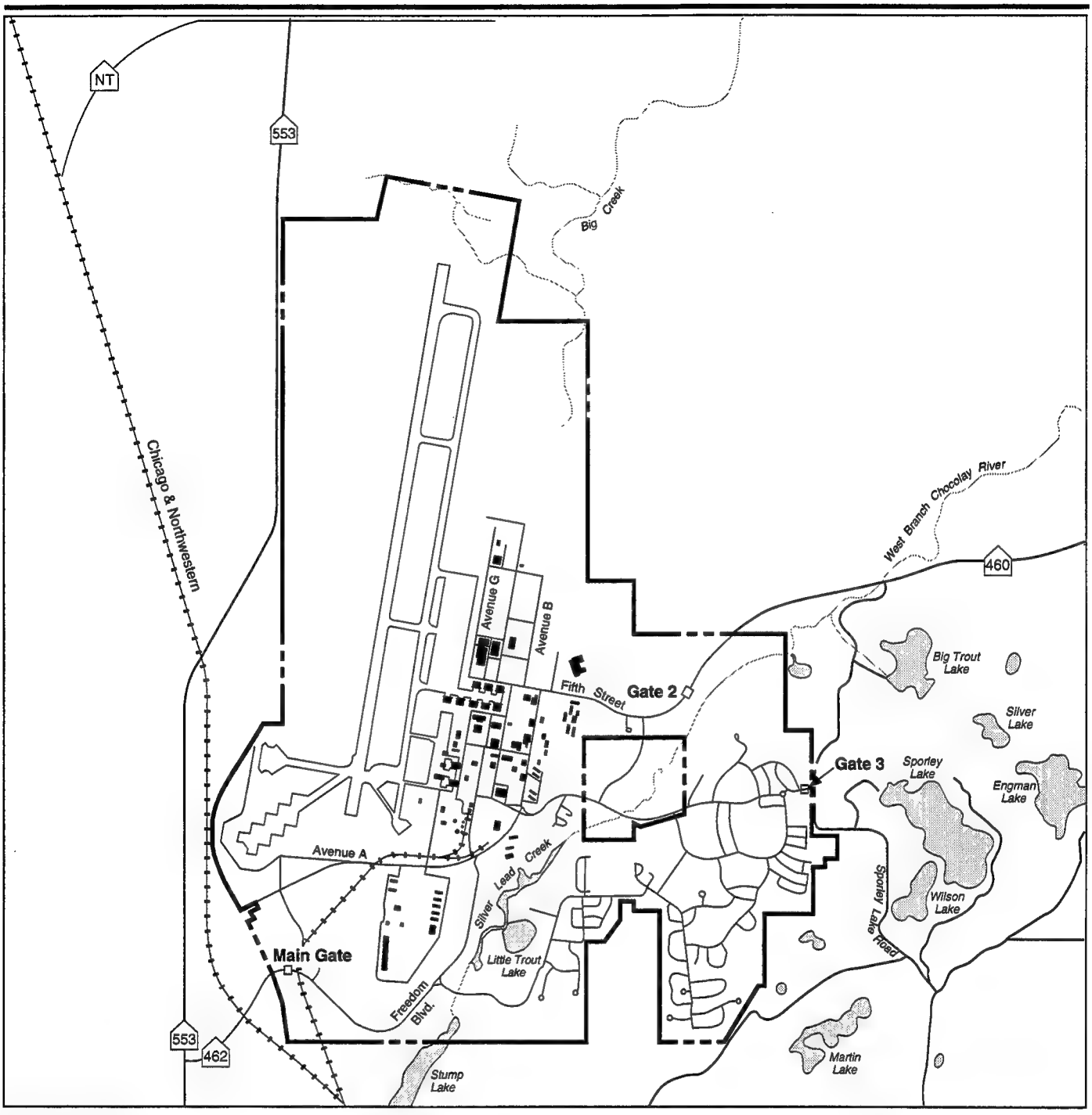
EXPLANATION

- 41 — U.S. Highway
- 35 — State Highway
- 553 — County Road
- Public Use Airport
- County Line
- C & NW — Chicago and Northwestern

Local Transportation System

0 2 4 8 Miles

Figure 3.7-1



EXPLANATION

Base Boundary

553 County Road

Key On-Base Roads

0 950 1900 3800 Feet

Figure 3.7-2

Table 3.7-1. Peak-Hour Traffic Volumes and LOS

Roadway	Segment	Preclosure (1992) Capacity[a] (PHV)	Preclosure (1992) Traffic[a] (PHV)	Preclosure (1992) LOS	Closure (1995) Traffic[a] (PHV)	Closure (1995) LOS
CR 462	Main Gate to CR 553	2,050	650	C	40	A
CR 460	Gate 2 to CR 545	2,050	200	B	10	A
CR 460	CR 545 to U.S. 41	2,050	160	A	150	A
CR 480	West of CR 553	1,750	440	C	350	B
CR 480	CR 553 to U.S. 41	2,050	280	B	300	B
CR 553	Marquette City Limits to CR 480	1,750	645	C	450	B
CR 553	CR 480 to CR 462	2,050	670	C	400	B
CR 553	CR 462 to Southgate Drive	2,050	730	C	400	B
CR 553	Southgate Drive to SH 35	2,050	420	B	300	B
CR 545	U.S. 41 to CR 460	1,700	100	A	100	A
CR 545	CR 460 to CR 456	1,700	25	A	50	A
CR 456	SH 35 to CR 545	1,700	195	B	150	A
CR 456	CR 545 to U.S. 41	1,700	60	A	50	A
U.S. 41	SH 28 to Skandia	2,050	710	C	700	C
U.S. 41	Skandia to SH 94	2,050	470	C	450	B
U.S. 41	SH 94 to CR 456	2,050	250	B	250	B
SH 35	CR 553 to CR 456	2,050	280	B	150	A
SH 35	CR 456 to Morbit Lake Access	2,050	80	A	100	A

Notes: Rolling terrain, 20 percent no passing, 60-40 directional split, and peak hour factor of 0.9 used in all capacity calculations.
(a) For two-lane highways, PHV and capacity are two-way.

CR = County Road
LOS = Level of Service
PHV = peak hour volume
SH = State Highway
U.S.# = U.S. Highway

limestone. Trucks heading southbound from the city of Marquette on CR 553 experience uphill grades, and this section has been studied for the possible addition of a truck lane.

Closure Conditions

Upon closure, key roadways will experience a reduction in traffic and corresponding improvement in LOS. As shown in Table 3.7-1, the LOS of all roadways either remained the same or improved. According to the Marquette County Highway Department, a growth factor of 1.0 percent per year was assumed for the years prior to closure. Traffic on base will be limited to the movement of the OL, which will be minimal. It is assumed that the Main Gate will be the only access to the base.

3.7.2 Air Transportation

Recent Trends

Air transportation includes passenger travel by commercial airline and charter flights, business and recreational travel by private (general) aviation, and priority package and freight delivery by commercial and air carriers. Marquette County Airport provides scheduled passenger service for the ROI. In 1992, Marquette County Airport recorded approximately 40,000 enplanements. There is no scheduled air cargo service at Marquette County Airport.

Closure Conditions

Marquette County Airport will experience a decrease in passenger traffic after closure of K. I. Sawyer AFB, primarily because of the loss of base-related traffic. In 1992, approximately 5 percent of Marquette County Airport traffic was attributable to residents of K. I. Sawyer AFB, while 20 percent of traffic was associated with business-related use. A total of 6,000 enplanements per year is estimated to be attributable to K. I. Sawyer AFB-related traffic.

3.7.3 Other Transportation Modes

Recent Trends

The Chicago and Northwestern Railroad provides freight service by a rail spur to K. I. Sawyer AFB. The tracks are seldom used, but they are well maintained.

Marquette Harbor is the major port in the ROI for exporting iron ore and importing coal and limestone. According to the 1992 Harbor Master Dock Report, the Presque Isle unloading dock located in the upper harbor is the only dock that exports iron ore. In 1992, 287 vessels exported 7,497,842 tons of coal and 12 vessels imported 264,936 tons of limestone. The dock at the Marquette Board of Light and Power imported 123,382 tons of coal and 330,655 tons of limestone on 23 vessels.

Closure Conditions

Upon closure of K. I. Sawyer AFB, there would be no notable change in activity to the Chicago and Northwestern Railroad or to activities in the Marquette Harbor.

3.8 UTILITIES

This section summarizes preclosure and closure conditions on utilities on K. I. Sawyer AFB and in the ROI. A more detailed presentation of these conditions is available in the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan. Utility demand forecasts in the ROI are shown in Table 3.8-1 for 1992 to closure.

Table 3.8-1. Estimated Preclosure and Baseline Utility Demand in the ROI, 1992 to Closure

	1992	1993	1994	Closure[a]
Water Consumption (MGD)[b]				
Preclosure Forecast	4.07	4.15	4.15	4.15
Closure Baseline	4.07	4.15	3.90	2.79
Wastewater Treatment (MGD)[b]				
Preclosure Forecast	4.45	4.44	4.41	4.41
Closure Baseline	4.45	4.44	4.19	3.13
Solid Waste (tons/day)				
Preclosure Forecast	148.11	139.04	153.83	153.83
Closure Baseline	148.11	139.04	135.34	124.95
Electrical Consumption (MWH/day)				
Preclosure Forecast	1,148	1,129	1,135	1,135
Closure Baseline	1,148	1,129	1,105	939.5
Natural Gas (MMCF/day)				
Preclosure Forecast	10.31	10.14	11.68	12.03
Closure Baseline	10.31	10.14	9.68	8.44

Notes: (a) Closure represents September 1995 conditions.
(b) These figures do not account for farm residences or commercial/industrial activities outside town or city limits.

MGD = million gallons per day
MMCF = million cubic feet
MWH = megawatt-hours

3.8.1 Water Supply

The ROI for water supply consists of K. I. Sawyer AFB and the areas served by the city of Marquette and Forsyth Township. The combined system capacity of these suppliers can provide up to 11.3 million gallons per day (MGD), with on-base usage comprising 21 percent of total capacity. In 1992, the average daily water use in the ROI was 4.07 MGD, with on-base use comprising 25 percent of the ROI demand.

Recent Trends

K. I. Sawyer AFB obtains water for domestic and industrial uses from five wells with a capacity of 3 MGD. Water is stored on base in four storage facilities: a large underground reservoir (approximately 500,000 gallons), an in-ground tank of 15,000 gallons, and two 200,000-gallon elevated towers. Total storage capacity of these facilities is 915,000 gallons. Average daily consumption in 1992 was approximately 1.0 MGD. The golf course is irrigated with water from Silver Lead Creek.

The city of Marquette obtains its water from Lake Superior and its average daily consumption was 2.67 MGD in 1992. The capacity of the pumping system is 11 MGD. The city is planning construction of a 6.4-MGD filtration plant by 1998 in accordance with an agreement with state and federal agencies.

Forsyth Township operates five wells and supplies the residents of Gwinn, Austin, Princeton, and New Swanzy. The system has a 1.3-MGD capacity and 250,000 gallons of storage. Residents located outside the urban areas, in Sands and West Branch Townships, rely on private wells for their water supply.

Closure Conditions

Water consumption at K. I. Sawyer AFB will decrease as the drawdown of personnel occurs from 1992 to closure. Demand from continuing operations of the OL will be approximately 0.02 in 1995. The resulting baseline demand within the ROI after closure in 1995 is estimated at 2.79 MGD (see Table 3.8-1). This estimate is 1.28 MGD lower than the 1992 demand in the ROI.

3.8.2 Wastewater

The ROI for wastewater treatment consists of K. I. Sawyer AFB and the areas served by the city of Marquette and Forsyth Township. The combined system capacity of these suppliers can provide up to 9.2 MGD, with on-base capacity comprising 45 percent of total capacity. In 1992, the average daily flow in the ROI was 4.45 MGD, with on-base flow comprising 20 percent of the ROI.

Recent Trends

Wastewater generated on K. I. Sawyer AFB is collected and processed by the base's tertiary treatment plant. The 2.5-MGD plant discharges approximately 0.9 MGD daily to the Silver Lead Creek under a National Pollutant Discharge Elimination System (NPDES) permit from the state of Michigan. The base's industrial wastes are pretreated in an aeration lagoon

prior to mixing with the base's domestic wastewater and treatment in the plant. Septic systems provide backup service to six lift stations and also to the main gate facility. Sludge from the treatment processes is pumped through a two-stage gravity thickening system and disposed of on forest lands.

The city of Marquette provides wastewater treatment to residents of the city and portions of Marquette and Chocolay townships. The city's WWTP has a capacity of 5.5 MGD and had average daily flows of 3.17 MGD in 1992. In 1994, the city stopped processing leachate from the county landfill. The city found that the leachate's biological oxygen demand was consuming the remaining organic loading capacity at the plant. Forsyth Township operates a three-cell lagoon with a design capacity of 0.4 MGD and treats wastewater from approximately 1,000 customers and two schools.

Closure Conditions

Wastewater treatment demand at K. I. Sawyer AFB will decrease with the drawdown of base personnel prior to closure. Demands from the OL activities will be approximately 0.01 MGD at closure. The resulting baseline demand within the ROI after closure in 1995 is estimated at 3.13 MGD (see Table 3.8-1). This estimate is 1.32 MGD lower than the 1992 demand in the ROI.

3.8.3 Solid Waste

The ROI for solid waste disposal consists of waste disposal facilities that serve the Marquette County area.

Recent Trends

Solid waste generated at K. I. Sawyer AFB is hauled off base by a commercial hauler and disposed of in the Marquette County landfill in Sands Township. This amount constituted approximately 12 percent of the solid waste disposed of in the ROI. Medical wastes are hauled off base weekly by private contractors.

Solid waste disposal in Marquette County is handled by a 53-acre landfill site operated by the Marquette County Solid Waste Management Authority. Prior to disposal, solid wastes are dumped in a processing facility and various materials removed for recycling or recovery. Remaining materials are processed by a baler and placed in landfill cells. The landfill has an expected life span of 23 years. Leachate from the landfill and liquids recovered during the material processing are collected and taken to the K. I. Sawyer AFB WWTP for disposal. The base has a renewable agreement with the county to take the leachate for 6 months.

Closure Conditions

Solid waste generation at K. I. Sawyer AFB will decrease with the drawdown of personnel prior to closure. Demand from the OL activities would be approximately 0.15 ton per day at closure. The resulting baseline demand within the ROI after closure is estimated at 124.95 tons per day. This estimate is 23.16 tons per day less than the 1992 demand in the ROI.

3.8.4 Energy

The ROI for energy consists of the local service areas for the Upper Peninsula Power Company (UPPCO), the Marquette Board of Light and Power, Michigan Gas Company, and Michigan Consolidated Gas Company.

Recent Trends

Electricity is provided to K. I. Sawyer AFB by UPPCO. In FY 1992, the base consumed approximately 156.11 megawatt-hours (MWH) per day. It is delivered to K. I. Sawyer AFB through an 11,200 kilovolt-ampere substation.

UPPCO and the city provide electrical power to customers in the Marquette area. The UPPCO system has the capability to meet electrical sales of 492 MWH per day in 1992. The city's service area had sales of 656 MWH per day.

Natural gas is provided to the base by Michigan Gas Company through a high pressure gas line entering near the Main Gate. A central heating plant provides high-temperature water to 1.6 million square feet of floor space at K. I. Sawyer AFB. This plant used 177 million cubic feet (MMCF) of natural gas in 1992 along with coal and wood to heat the base. In addition to high temperature water, natural gas is supplied to the base housing units.

Michigan Gas Company serves 13 counties and 89,000 customers in Michigan. In Marquette County, the company serves 14,000 customers including K. I. Sawyer AFB. Michigan Consolidated Gas Company provides natural gas to 1,210 customers in Forsyth Township, including Gwinn. K. I. Sawyer AFB consumed approximately 1.04 MMCF per day in 1992. This amount constituted 9.2 percent of the natural gas consumed in the ROI in 1992.

Closure Conditions

Electrical consumption at K. I. Sawyer AFB will decrease with the drawdown of personnel prior to closure. Demand from the OL activities could be approximately 15 MWH per day at closure. The resulting baseline demand within the ROI after closure in 1995 is estimated at 939.5 MWH per day.

Natural gas consumption at K. I. Sawyer AFB from the OL activities is estimated to be 8.44 MMCF per day at closure. Natural gas consumption in the ROI is expected to decrease to 8.44 MMCF per day.

3.9 MARQUETTE COUNTY AIRPORT

Socioeconomic trends relating to the relocation of Marquette County Airport activities to K. I. Sawyer AFB are described in this section. The socioeconomic conditions are described below for each of the issues discussed in this chapter.

Marquette County Airport is located within Negaunee Township, approximately 7 miles west of the city of Marquette along U.S. 41 (see Figure 1.4-7). The airport consists of 670 acres of property with avigation easements on 90 acres and leases on 70 acres of property. The airport has one main terminal building and several maintenance hangars. The airport facilities were constructed between the late 1950s and 1989.

Economic Activity. Total direct employment at Marquette County Airport is 408 employees. Indirect employment created by the expenditures attributable to the airport generate an additional 386 jobs in the region.

Marquette County Airport has an estimated total economic impact of $48 million annually. Of this total economic impact, $26 million is estimated to be direct annual impacts related to payrolls, expenditures, and operating expenses of the airport.

With the closure of Marquette County Airport, all jobs are expected to be relocated to K. I. Sawyer AFB.

Population. The ROI population is presented in Section 3.3. Because all jobs are anticipated to be relocated to K. I. Sawyer AFB, no out-migrating population will be expected in the ROI due to the closure of Marquette County Airport.

Housing. A description of housing trends is presented in Section 3.4. No changes in ROI housing demand is anticipated based upon the relocation of Marquette County Airport to K. I. Sawyer AFB.

Public Services. A discussion of local government, public education, police and fire protection, and health care is presented in Section 3.5. No changes to these public services are anticipated due to the relocation of Marquette County Airport to K. I. Sawyer AFB.

Public Finance. A discussion of public finance is presented in Section 3.6. With the relocation of all activities at Marquette County Airport to K. I. Sawyer AFB, changes to local public finances are anticipated. The public

and private ownership of the property may cause changes to the local tax structure.

Transportation. Marquette County Airport provides commercial passenger, aircraft maintenance, and general aviation services. No scheduled air cargo service is provided at the airport. Access to the airport is provided by U.S. 41. Local roadway service is adequate for the industrial and airport-related activities.

Utilities. Water is supplied to Marquette County Airport by the Negaunee Township, sanitary wastewater is handled by Negaunee WWTP, and solid waste disposal is deposited to the Marquette County Landfill. Electricity is supplied by the Marquette Board of Light and Power, and the Michigan Gas Company supplies natural gas to the airport.

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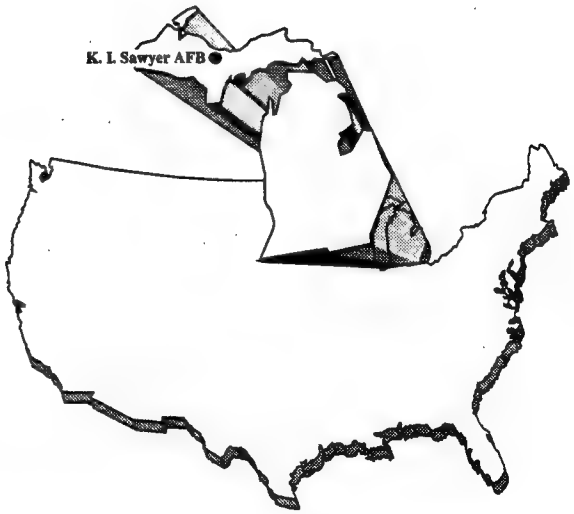


CHAPTER 4
SOCIOECONOMIC EFFECTS OF PROPOSED ACTION AND ALTERNATIVES

4.0 SOCIOECONOMIC EFFECTS OF PROPOSED ACTION AND ALTERNATIVES

4.1 INTRODUCTION

This chapter discusses the potential socioeconomic effects associated with the Proposed Action and three alternatives for reuse of K. I. Sawyer AFB, as well as the No-Action Alternative. The purpose of this study is to identify and analyze the major socioeconomic issues related to each of the five possibilities for future activity at the base and compare the effects of these alternatives with one another.

To help identify potential socioeconomic effects of reuse of K. I. Sawyer AFB, this study addresses a range of reasonable reuse alternatives. For the purpose of this analysis, the Air Force has adopted the redevelopment plan developed by the K. I. Sawyer Base Conversion Authority as the Proposed Action. In addition, the Air Force has analyzed the effects associated with other reasonable reuse alternatives. These include the International Wayport Alternative, the Commercial Aviation Alternative, the Recreation Alternative, and the No-Action Alternative without reuse. Actual decisions on reuse of the property will be made by its recipients subsequent to conveyance.

Descriptions of the effects of the Proposed Action and the reuse alternatives are provided sequentially for each of seven major issue areas: economic activity, population, housing, public services, public finance, transportation, and utilities. The Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan, provides more detailed descriptions of effects for transportation and utilities.

The description of effects of the No-Action Alternative is the same as the closure conditions described in Chapter 3. Closure baseline includes the presence of the OL. The No-Action Alternative represents the baseline conditions to which the reuse alternatives are compared.

Context of Analysis. This analysis addresses the timing of effects associated with each of the various alternative plans for future reuse of the base. The analysis covers a period extending 20 years beyond the date of closure of K. I. Sawyer AFB (September 30, 1995), and the results are presented for each of the alternatives for 2000 (5 years after closure), 2005 (10 years after closure), and 2015 (20 years after closure).

Of particular importance in this analysis are site- and migratory-related effects. Site-related effects include all activities associated with the base area. These would include all direct and secondary employment and their effects on population as a result of reuse- or OL-related activities.

Migratory-related effects are defined to be all of the effects associated with persons that move into the ROI solely as a result of reuse-related activities. The migratory-related effects are a component of the site-related effects. In addition to these migratory-related effects, the site-related effects include the reuse activities or caretaker activities that are filled by the resources within the ROI before closure. For example, the Proposed Action would generate a number of jobs; some would be filled by the local available labor pool and others would be filled by persons moving into the ROI for the purpose of gaining employment related to the reuse activities.

Many socioeconomic effects are caused primarily by population in-migration. These effects include changes in housing demand, public service requirements, local government expenditures and revenues, traffic volumes, and utility consumption. This analysis addresses the implications of population in-migration for each of these key related indicators.

This analysis recognizes the potential for community reactions stemming from "announcement effects" of information regarding the base's closure or reuse. Such announcements may affect the community's perceptions and, thus, could have important local economic consequences.

An example of an announcement effect would be the in-migration of people anticipating employment under one of the reuse options. If it were announced later that the No-Action Alternative was chosen, many of these newcomers would leave the area seeking employment elsewhere. This announcement effect would thus include (a) a temporary increase in population in anticipation of future employment, and (b) a subsequent decline in population as people leave the area after the announcement. Bases with more than one closure announcement may not experience as severe an announcement effect.

Changes associated with announcement effects, while potentially important, are highly unpredictable and difficult to quantify. Such effects, therefore, were excluded from the quantitative analysis in this study, and are not displayed in any of the tabular or graphic data presented in this report.

The methods used to evaluate the effects of reuse of the site are consistent with those used to assess the effects of closure. These methods are described in Appendix B.

4.2 ECONOMIC ACTIVITY

Under the No-Action Alternative, or closure baseline, K. I. Sawyer AFB would not be reused and OL activities at the site would contribute little economic stimulus to the ROI. Under this alternative, employment in the ROI is projected to increase from 53,159 at closure to 64,065 by 2015,

which represents an annual average growth rate of approximately 0.9 percent (extrapolated from projections by NPA Data Services, Inc., 1993).

Of the reuse alternatives evaluated for this study, the Proposed Action would generate the greatest economic effects.

4.2.1 Proposed Action

Direct Jobs. Employment associated with the Proposed Action would begin immediately upon its implementation. The number of direct jobs over the closure baseline would reach 2,668 in 2000 and 9,853 in 2015 (Table 4.2-1). Nearly all of these direct jobs would be associated with operations activities on the site, with about 6.0 percent of direct jobs attributable to construction by 2000, declining to 1.6 percent by 2015. Industrial and commercial activities are projected to create the greatest number of jobs of any of the on-site activities.

Secondary and Total Jobs. Under the Proposed Action, the multiplier effects of worker spending and purchases of goods and services by new businesses on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs over the closure baseline is projected to be 1,986 in 2000 and 7,450 in 2015. Combining direct and secondary jobs would increase the total number of jobs created by the Proposed Action over the closure baseline to 4,654 in 2000 and 17,303 in 2015 (see Table 4.2-1).

Earnings. Total annual earnings generated by the Proposed Action over the closure baseline are projected to be $127,101,957 in 2000 and $474,788,299 in 2015 (see Table 4.2-1). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at $81,167,444 in 2000 and $315,276,679 in 2015. Secondary earnings would represent about $154,998,404 by 2015.

ROI Jobs with the Proposed Action. The total number of jobs in the ROI would increase from 53,159 at closure to 59,744 in 2000 and 81,368 in 2015 (see Table 4.2-1). The average annual employment growth rate in the ROI would be 2.2 percent under the Proposed Action, compared to 0.9 percent under the closure baseline. The trend in ROI employment with the Proposed Action compared to the closure baseline and the other reuse alternatives is shown in Figure 4.2-1.

In-Migrating Workers. With the Proposed Action, 19.1 percent of the jobs created are expected to be filled by workers relocating into the ROI. Depending on specific skills needed and general economic conditions, other jobs would be filled by workers residing within the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to reach 884 in 2000 and

Table 4.2-1. ROI Employment and Earnings Projections: Proposed Action

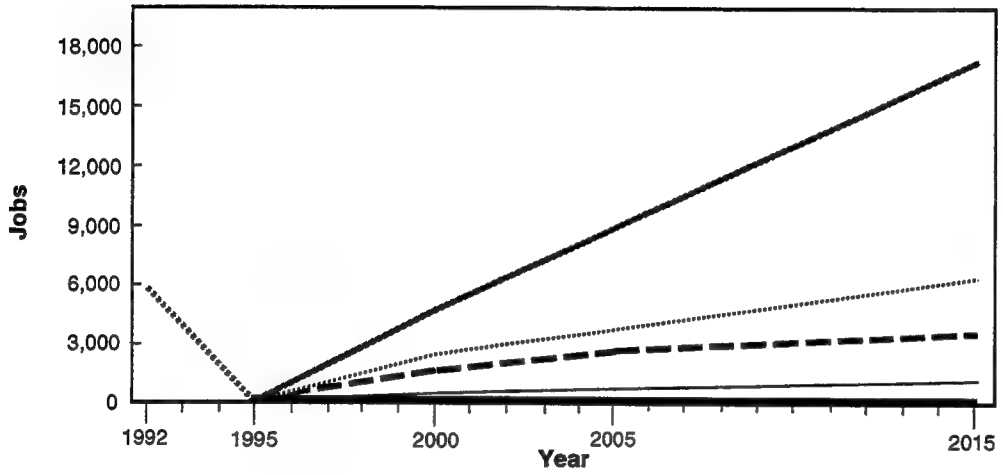
	2000	2005	2015
Site-Related Employment and Earnings			
Reuse Effects			
Employment			
Direct	2,718	5,114	9,903
Construction	159	159	159
Operations	2,559	4,955	9,744
Secondary	1,999	3,820	7,463
Total	4,717	8,934	17,366
Earnings[a]			
Direct	86,879,707	164,931,520	320,980,796
Construction	4,521,362	4,513,216	4,513,216
Operations	82,358,345	160,418,304	316,467,580
Secondary	41,692,309	79,580,868	155,277,562
Total	128,572,016	244,492,388	476,258,358
No-Action Effects[b]			
Employment			
Direct	50	50	50
Secondary	13	13	13
Total	63	63	63
Earnings[a]			
Direct	1,190,901	1,190,901	1,190,901
Secondary	279,158	279,158	279,158
Total	1,470,059	1,470,059	1,470,059
Reuse Increase Over No-Action Effects			
Employment			
Direct	2,668	5,064	9,853
Construction	159	159	159
Operations	2,509	4,905	9,694
Secondary	1,986	3,807	7,450
Total	4,654	8,871	17,303
Earnings[a]			
Direct	85,688,806	163,740,619	319,789,895
Construction	4,521,362	4,513,216	4,513,216
Operations	81,167,444	159,227,403	315,276,679
Secondary	41,413,151	79,281,710	154,998,404
Total	127,101,957	243,022,329	474,788,299
ROI Employment			
With No-Action Alternative	55,090	57,892	64,065
With Proposed Action	59,744	66,763	81,368
In-Migrating Workers[c]			
Direct	784	1,503	2,939
Construction	16	16	16
Operations	768	1,487	2,923
Secondary	100	191	373
Total	884	1,694	3,312

Notes: (a) Constant 1992 dollars.
(b) No-Action effects are the closure baseline projection, extended beyond closure and the Operating Location in caretaker status. Effects include both direct and secondary employment and earnings.
(c) In-migrating workers are holders of site-related jobs expected to move to the area with reuse but who would not without reuse. Includes an estimated 160 workers by the year 2015 who would move to the area but outside the ROI. Refer to Appendix B (Methods) for migratory-related employment assumptions.

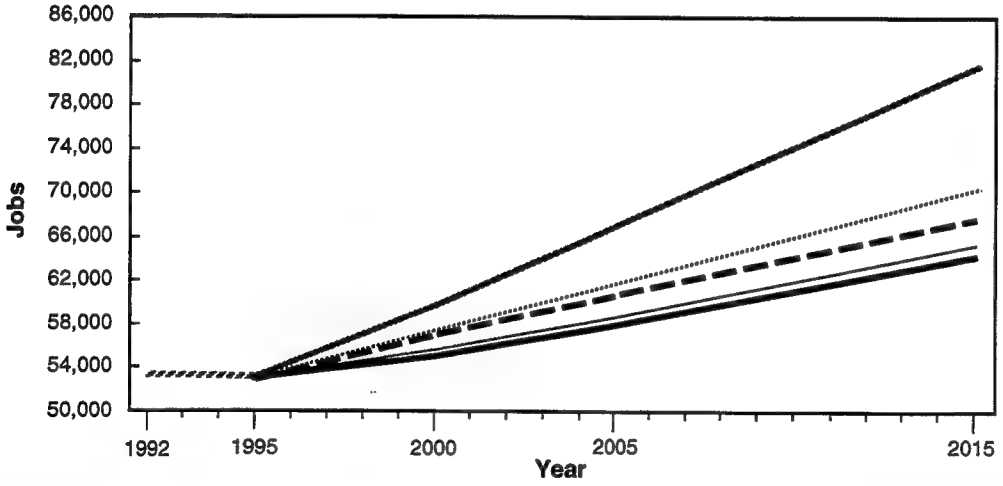
ROI = Region of Influence

ALTERNATIVE	1995 (a)	2000	2005	2015
Proposed Action	63	4,654	8,871	17,303
International Wayport Alternative	63	2,448	3,867	6,372
Commercial Aviation Alternative	63	1,738	2,743	3,542
Recreation Alternative	63	509	829	1,176

Reuse-Related Employment Effects (b)



Reuse-Related Employment Effects (b)



Total ROI Employment Including Reuse-Related Effects

EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative

(a) The 1995 values represent total base-related employment under the closure baseline.

(b) Employment effects represent the change in employment relative to the No-Action Alternative.

Reuse-Related Employment Effects

Figure 4.2-1

3,312 in 2015 (see Table 4.2-1). The remaining 80.9 percent of the reuse jobs would be filled by residents within the ROI.

4.2.2 International Wayport Alternative

Direct Jobs. Employment associated with the International Wayport Alternative would begin immediately upon its implementation. The number of direct jobs over the closure baseline would increase to 1,489 in 2000 and 3,844 in 2015 (Table 4.2-2). Nearly all of these direct jobs would be associated with operations activities on the site, with about 5.6 percent of direct jobs attributable to construction by 2000, declining to 1.7 percent by 2015. Industrial and aviation support activities are projected to create the greatest number of jobs of any of the on-site activities.

Secondary and Total Jobs. Under the International Wayport Alternative, the multiplier effects of worker spending and purchases of goods and services by new businesses on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs over the closure baseline is projected to be 959 in 2000 and 2,528 in 2015. Combining direct and secondary jobs would increase the total number of jobs created by the International Wayport Alternative over the closure baseline to 2,448 in 2000 and 6,372 in 2015 (see Table 4.2-2).

Earnings. Total annual earnings generated by the International Wayport Alternative over the closure baseline are projected to be $62,739,670 in 2000 and $165,583,200 in 2015 (see Table 4.2-2). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at $42,805,836 in 2000 and $113,393,953 in 2015. Secondary earnings would represent about $52,189,247 by 2015.

ROI Jobs with the International Wayport Alternative. The total number of jobs in the ROI would increase from 53,159 at closure to 57,538 in 2000 and 70,437 in 2015 (see Table 4.2-2). The average annual employment growth rate in the ROI would be 1.4 percent under the International Wayport Alternative, compared to 0.9 percent under the closure baseline. The trend in ROI employment with the International Wayport Alternative compared to the closure baseline and the other reuse alternatives is shown in Figure 4.2-1.

In-Migrating Workers. Under the International Wayport Alternative, 20.1 percent of the jobs created are expected to be filled by workers relocating into the ROI. Depending on specific skills needed and general economic conditions, other jobs would be filled by workers residing within the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to reach 493 in 2000 and 1,282 in 2015 (see Table 4.2-2). The

Table 4.2-2. ROI Employment and Earnings Projections: International Wayport Alternative

	2000	2005	2015
Site-Related Employment and Earnings			
Reuse Effects			
Employment			
Direct	1,539	2,386	3,894
Construction	84	67	67
Operations	1,455	2,319	3,827
Secondary	972	1,544	2,541
Total	2,511	3,930	6,435
Earnings[a]			
Direct	43,996,737	69,836,490	114,584,854
Construction	2,376,410	1,905,570	1,905,570
Operations	41,620,327	67,930,920	112,679,284
Secondary	20,212,992	31,982,551	52,468,405
Total	64,209,729	101,819,041	167,053,259
No-Action Effects[b]			
Employment			
Direct	50	50	50
Secondary	13	13	13
Total	63	63	63
Earnings[a]			
Direct	1,190,901	1,190,901	1,190,901
Secondary	279,158	279,158	279,158
Total	1,470,059	1,470,059	1,470,059
Reuse Increase Over No-Action Effects			
Employment			
Direct	1,489	2,336	3,844
Construction	84	67	67
Operations	1,405	2,269	3,777
Secondary	959	1,531	2,528
Total	2,448	3,867	6,372
Earnings[a]			
Direct	42,805,836	68,645,589	113,393,953
Construction	2,376,410	1,905,570	1,905,570
Operations	40,429,426	66,740,019	111,488,383
Secondary	19,933,834	31,703,393	52,189,247
Total	62,739,670	100,348,982	165,583,200
ROI Employment			
With No-Action Alternative	55,090	57,892	64,065
With International Wayport Alternative	57,538	61,759	70,437
In-Migrating Workers[c]			
Direct	445	703	1,155
Construction	8	7	7
Operations	437	696	1,148
Secondary	48	77	127
Total	493	780	1,282

Notes: (a) Constant 1992 dollars.
(b) No-Action effects are the closure baseline projection, extended beyond closure and the Operating Location in caretaker status. Effects include both direct and secondary employment and earnings.
(c) In-migrating workers are holders of site-related jobs expected to move to the area with reuse but who would not without reuse. Includes an estimated 62 workers by the year 2015 who would move to the area but outside the ROI. Refer to Appendix B (Methods) for migratory-related employment assumptions.

ROI = Region of Influence

remaining 79.9 percent of the reuse jobs would be filled by residents of the ROI.

4.2.3 Commercial Aviation Alternative

Direct Jobs. Employment associated with the Commercial Aviation Alternative would begin immediately upon its implementation. The number of direct jobs over the closure baseline would increase to 1,035 in 2000 and 2,176 in 2015 (Table 4.2-3). Nearly all of these direct jobs would be associated with operations activities on the site, with about 6.5 percent of direct jobs attributable to construction by 2000, declining to 2.3 percent by 2015. Aviation support and institutional (educational) activities are projected to create the greatest number of jobs of any of the on-site activities.

Secondary and Total Jobs. Under the Commercial Aviation Alternative, the multiplier effects of worker spending and purchases of goods and services by new businesses on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs over the closure baseline is projected to be 703 in 2000 and 1,366 in 2015. Combining direct and secondary jobs would increase the total number of jobs created by the Commercial Aviation Alternative to 1,738 in 2000 and 3,542 in 2015 (see Table 4.2-3).

Earnings. Total annual earnings generated by the Commercial Aviation Alternative over the closure baseline are projected to be $44,791,378 in 2000 and $89,074,034 in 2015 (see Table 4.2-3). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at $28,360,221 in 2000 and $59,534,453 in 2015. Secondary earnings would total $28,126,502 by 2015.

ROI Jobs with the Commercial Aviation Alternative. The total number of jobs in the ROI would increase from 53,159 at closure to 56,828 in 2000 and 67,607 in 2015 (see Table 4.2-3). The average annual employment growth rate in the ROI would be 1.2 percent under the Commercial Aviation Alternative, compared to 0.9 percent under the closure baseline. The trend in ROI employment with the Commercial Aviation Alternative compared to the closure baseline and the other reuse alternatives is shown in Figure 4.2-1.

In-Migrating Workers. With the Commercial Aviation Alternative, 20.5 percent of the jobs created are expected to be filled by workers relocating into the ROI. Depending on specific skills needed and general economic conditions, other jobs would be filled by workers residing within the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to reach 348 in 2000 and 727 in 2015 (see Table 4.2-3). The

Table 4.2-3. ROI Employment and Earnings Projections: Commercial Aviation Alternative

	2000	2005	2015
Site-Related Employment and Earnings			
Reuse Effects			
Employment			
Direct	1,085	1,700	2,226
Construction	67	49	49
Operations	1,018	1,651	2,177
Secondary	716	1,106	1,379
Total	1,801	2,806	3,605
Earnings[a]			
Direct	31,516,510	49,634,546	62,138,433
Construction	1,965,388	1,413,079	1,413,079
Operations	29,551,122	48,221,467	60,725,354
Secondary	14,744,927	22,832,356	28,405,660
Total	46,261,437	72,466,902	90,544,093
No-Action Effects[b]			
Employment			
Direct	50	50	50
Secondary	13	13	13
Total	63	63	63
Earnings[a]			
Direct	1,190,901	1,190,901	1,190,901
Secondary	279,158	279,158	279,158
Total	1,470,059	1,470,059	1,470,059
Reuse Increase Over No-Action Effects			
Employment			
Direct	1,035	1,650	2,176
Construction	67	49	49
Operations	968	1,601	2,127
Secondary	703	1,093	1,366
Total	1,738	2,743	3,542
Earnings[a]			
Direct	30,325,609	48,443,645	60,947,532
Construction	1,965,388	1,413,079	1,413,079
Operations	28,360,221	47,030,566	59,534,453
Secondary	14,465,769	22,553,198	28,126,502
Total	44,791,378	70,996,843	89,074,034
ROI Employment			
With No-Action Alternative	55,090	57,892	64,065
With Commercial Aviation Alternative	56,828	60,635	67,607
In-Migrating Workers[c]			
Direct	312	500	658
Construction	7	5	5
Operations	305	495	653
Secondary	36	55	69
Total	348	555	727

Notes: (a) Constant 1992 dollars.
(b) No-Action effects are the closure baseline projection, extended beyond closure and the Operating Location in caretaker status. Effects include both direct and secondary employment and earnings.
(c) In-migrating workers are holders of site-related jobs expected to move to the area with reuse but who would not without reuse. Includes an estimated 35 workers by the year 2015 who would move to the area but outside the ROI. Refer to Appendix B (Methods) for migratory-related employment assumptions.

ROI = Region of Influence

remaining 79.5 percent of the reuse jobs would be filled by residents of the ROI.

4.2.4 Recreation Alternative

Direct Jobs. Employment associated with the Recreation Alternative would begin immediately upon its implementation. The number of direct jobs over the closure baseline would reach 355 in 2000 and 806 in 2015 (Table 4.2-4). Nearly all of the direct jobs would be associated with operations activities on the site, with 8.6 percent of all direct jobs attributable to construction by 2000, declining to 1.5 percent by 2015. Industrial and public facilities/recreation activities are projected to create the greatest number of jobs of any of the on-site activities.

Secondary and Total Jobs. Under the Recreation Alternative, the multiplier effects of worker spending and purchases of goods and services by new businesses on the site would create additional off-site secondary jobs in the ROI. The number of secondary jobs over the closure baseline is projected to be 154 in 2000 and 370 in 2015. Combining direct and secondary jobs would increase the total number of jobs created by the Recreation Alternative over the closure baseline to 509 in 2000 and 1,176 in 2015 (see Table 4.2-4).

Earnings. Total annual earnings generated by the Recreation Alternative over the closure baseline are projected to be $10,707,064 in 2000 and $24,981,820 in 2015 (see Table 4.2-4). Most of these earnings would be attributable to direct operations jobs, with earnings from this source estimated at $6,455,485 in 2000 and $16,965,861 in 2015. Secondary earnings would total $7,639,309 by 2015.

ROI Jobs with the Recreation Alternative. The total number of jobs in the ROI would increase from 53,159 at closure to 55,599 in 2000 and 65,241 in 2015 (see Table 4.2-4). The average annual employment growth rate in the ROI would be 1.0 percent under the Recreation Alternative, compared to 0.9 percent under the closure baseline. The trend in ROI employment with the Recreation Alternative compared to the closure baseline and the other reuse alternative is shown in Figure 4.2-1.

In-Migrating Workers. Depending on specific skills needed and general economic conditions, 23.2 percent of the jobs created by the Recreation Alternative over the closure baseline are expected to be filled by workers relocating into the ROI by 2015. The remaining positions would be filled by workers residing within the ROI. Relocation is expected to start for some types of jobs at the earliest stages of reuse. The total number of in-migrating workers is expected to reach 123 in 2000 and 273 in 2015 (see Table 4.2-4).

Table 4.2-4. ROI Employment and Earnings Projections: Recreation Alternative

	2000	2005	2015
Site-Related Employment and Earnings			
Reuse Effects			
Employment			
Direct	405	631	856
Construction	35	13	13
Operations	370	618	843
Secondary	167	261	383
Total	572	892	1,239
Earnings[a]			
Direct	8,706,028	12,820,943	18,533,412
Construction	1,059,642	376,650	376,650
Operations	7,646,386	12,444,293	18,156,762
Secondary	3,471,095	5,406,462	7,918,467
Total	12,177,123	18,227,405	26,451,879
No-Action Effects[b]			
Employment			
Direct	50	50	50
Secondary	13	13	13
Total	63	63	63
Earnings[a]			
Direct	1,190,901	1,190,901	1,190,901
Secondary	279,158	279,158	279,158
Total	1,470,059	1,470,059	1,470,059
Reuse Increase Over No-Action Effects			
Employment			
Direct	355	581	806
Construction	35	13	13
Operations	320	568	793
Secondary	154	248	370
Total	509	829	1,176
Earnings[a]			
Direct	7,515,127	11,630,042	17,342,511
Construction	1,059,642	376,650	376,650
Operations	6,455,485	11,253,392	16,965,861
Secondary	3,191,937	5,127,304	7,639,309
Total	10,707,064	16,757,346	24,981,820
ROI Employment			
With No-Action Alternative	55,090	57,892	64,065
With Recreation Alternative	55,599	58,721	65,241
In-Migrating Workers[c]			
Direct	115	186	254
Construction	4	1	1
Operations	111	185	253
Secondary	8	13	19
Total	123	199	273

Notes: (a) Constant 1992 dollars.
(b) No-Action Effects are the closure baseline projections, extended beyond closure with the Operating Location in caretaker status. Effects include both direct and secondary employment and earnings.
(c) In-migrating workers are holders of site-related jobs expected to move to the area with reuse but who would not without reuse. Includes an estimated 13 workers by 2015 who would move to the area but live outside the ROI. Refer to Appendix B (Methods) for migratory-related employment assumptions.

ROI = Region of Influence

4.2.5 No-Action Alternative

Employment and earnings effects under the No-Action Alternative would be the same as those described in Section 3.2 as closure conditions and as briefly highlighted in the introductory paragraph of this section.

4.3 POPULATION

If no reuse of K. I. Sawyer AFB occurs, total population in the ROI is anticipated to increase from 103,322 at closure to 114,895 in 2015. These figures are preclosure population projections developed by NPA Data Services, Inc., and adjusted for closure and the resulting out-migrating population. This represents an average annual growth of 0.5 percent. The Proposed Action would have the greatest effects on population of any of the reuse alternatives evaluated in this study.

Population In-Migration Assumptions. As described in Appendix B, some of the employment opportunities created by the reuse alternatives would be filled by workers and their dependents relocating to the ROI, creating ROI population in-migration. This in-migrating population is expected to experience natural increases (births minus deaths).

Residential Distribution Assumptions. In-migrating workers are expected to locate within the ROI based on 1993 population and commuting patterns. Direct workers are expected to choose places of residence similar to those of the civilian workers at the base prior to closure. Secondary workers would exhibit residential preferences similar to those of direct workers or to the distribution of the off-base ROI population, based on 1990 census data.

4.3.1 Proposed Action

Site-Related Population. Total site-related population includes both (a) those households where at least one member has a site-related job who would live in the ROI without the Proposed Action, and (b) those who would reside in the ROI due to the Proposed Action (the migratory-related population). The total site-related population is projected to reach 14,176 in 2000 and 57,736 in 2015 (Table 4.3-1). A total of 46,866 persons (81.2 percent) would reside in Marquette County by 2015, with 8,608 (14.9 percent) in Delta County, 19,464 (33.7 percent) in Forsyth Township, and 8,057 (14.0 percent) in the city of Marquette.

Migratory-Related Population Change. The migratory-related population changes expected to occur in the ROI due to the Proposed Action are shown in Table 4.3-2. These figures represent persons living in the ROI who would not live there without reuse of the base. Migratory-related population changes caused by the Proposed Action are projected at 2,528 in 2000 and 10,483 in 2015. In 2015, 9,233 (88.1 percent of the ROI total) are

Table 4.3-1 Site-Related Population: Proposed Action

	2000	2005	2015
Persons by Labor Category of Employee			
Direct	8,146	15,868	32,836
Construction	481	497	531
Operations	7,665	15,371	32,305
Secondary	6,030	11,932	24,900
Total	14,176	27,800	57,736
Persons by Location			
Marquette County	11,514	22,572	46,866
Forsyth Township	4,791	9,380	19,464
Sands Township	1,027	2,012	4,175
West Branch Township	682	1,335	2,771
City of Ishpeming	514	1,009	2,098
City of Marquette	1,975	3,877	8,057
City of Negaunee	629	1,234	2,562
Rest of County	1,896	3,725	7,739
Delta County	2,104	4,139	8,608
ROI Total	13,618	26,711	55,474
Outside ROI	558	1,089	2,262
Total	14,176	27,800	57,736

Note: Site-related population represents all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

ROI = Region of Influence

expected to live in Marquette County, with 1,250 (11.9 percent) in Delta County, 4,205 (40.1 percent) in Forsyth Township, and 1,412 (13.5 percent) in the city of Marquette.

ROI Population. Population in the ROI would increase from 103,322 at closure to 108,511 in 2000 and 125,378 in 2015 (see Table 4.3-2). The average annual rate of population growth in the ROI during this 20-year period would be 1.0 percent, compared to 0.5 percent for the closure baseline. The projected ROI population trend compared to the closure baseline and the other reuse alternatives is presented in Figure 4.3-1.

4.3.2 International Wayport Alternative

Site-Related Population. The total site-related population is projected to increase to 7,543 in 2000 and 21,390 in 2015 (Table 4.3-3). A total of 17,429 people (81.5 percent) would reside in Marquette County by 2015,

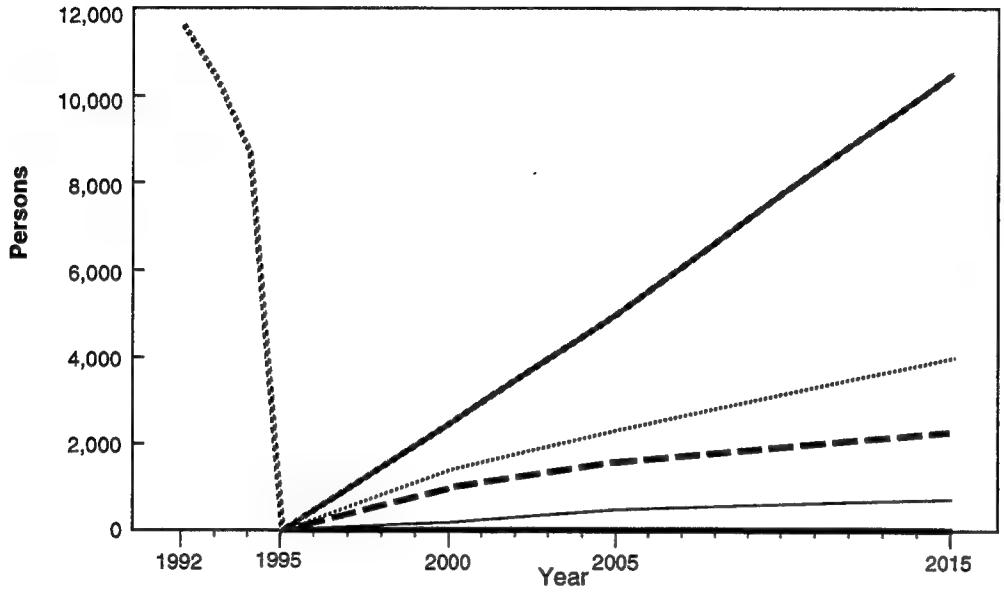
Table 4.3-2. Total Regional Population Effects - Counties and Selected Communities: Proposed Action

	2000	2005	2015
ROI Population Projections			
With No-Action Alternative			
Marquette County	65,825	67,848	71,890
Forsyth Township	3,493	3,743	4,244
Sands Township	1,539	1,615	1,769
West Branch Township	708	772	900
City of Ishpeming	7,678	7,883	8,294
City of Marquette	22,887	23,514	24,767
City of Negaunee	4,990	5,125	5,396
Rest of County	24,530	25,196	26,520
Delta County	40,158	40,893	43,005
ROI Total	105,983	108,741	114,895
Migratory-Related Population Changes[a]			
Reuse Effects			
Marquette County	2,226	4,416	9,233
Forsyth Township	1,014	2,011	4,205
Sands Township	214	424	887
West Branch Township	140	278	580
City of Ishpeming	82	163	342
City of Marquette	340	675	1,412
City of Negaunee	118	235	490
Rest of County	318	630	1,317
Delta County	302	598	1,250
ROI Total	2,528	5,014	10,483
ROI Population Projections			
With Reuse			7
Marquette County	68,051	72,264	81,123
Forsyth Township	4,507	5,754	8,449
Sands Township	1,753	2,039	2,656
West Branch Township	848	1,050	1,480
City of Ishpeming	7,760	8,046	8,636
City of Marquette	23,227	24,189	26,179
City of Negaunee	5,108	5,360	5,886
Rest of County	24,848	25,826	27,837
Delta County	40,460	41,491	44,255
ROI Total	108,511	113,755	125,378

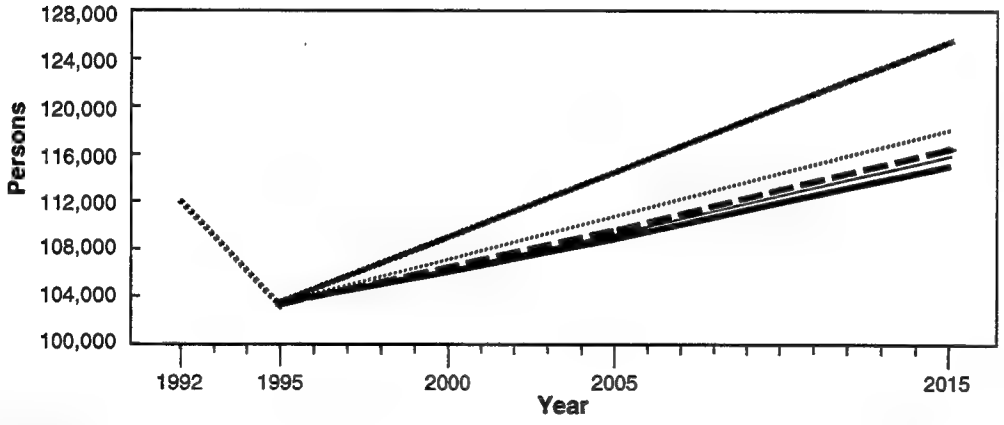
Note: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.
ROI = Region of Influence

ALTERNATIVE	1995 (a)	2000	2005	2015
Proposed Action	0	2,528	5,014	10,483
International Wayport Alternative	0	1,411	2,309	4,056
Commercial Aviation Alternative	0	995	1,645	2,301
Recreation Alternative	0	351	592	863

Migratory-Related Population Effects (b)



Migratory-Related Population Effects (b)



Total ROI Population Including Migratory-Related Effects

EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative

Migratory-Related Population Effects

(a) 1995 represents closure conditions.
(b) Migratory (Reuse)-related population effects are the persons that would move into the ROI solely as a result of reuse.

Figure 4.3-1

Table 4.3-3. Site-Related Population: International Wayport Alternative

	2000	2005	2015
Persons by Labor Category of Employee			
Direct	4,610	7,403	12,912
Construction	252	209	224
Operations	4,358	7,194	12,688
Secondary	2,933	4,823	8,478
Total	7,543	12,226	21,390
Persons by Location			
Marquette County	6,151	9,964	17,429
Forsyth Township	2,589	4,186	7,318
Sands Township	554	896	1,566
West Branch Township	367	594	1,038
City of Ishpeming	269	437	765
City of Marquette	1,041	1,690	2,959
City of Negaunee	335	543	950
Rest of County	996	1,618	2,833
Delta County	1,089	1,773	3,106
ROI Total	7,240	11,737	20,535
Outside ROI	303	489	855
Total	7,543	12,226	21,390

Note: Site-related population represents all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

ROI = Region of Influence

with 3,106 (14.5 percent) in Delta County, 7,318 (34.2 percent) in Forsyth Township, and 2,959 (13.8 percent) in the city of Marquette.

Migratory-Related Population Change. The migratory-related population changes expected to occur due to the International Wayport Alternative are shown in Table 4.3-4 for the ROI. Migratory-related population changes caused by the International Wayport Alternative are projected at 1,411 in 2000 and 4,056 in 2015. In 2015, 3,578 (88.2 percent of the ROI total) are expected to live in Marquette County, with 478 (11.8 percent) in Delta County, 1,635 (40.3 percent) in Forsyth Township, and 544 (13.4 percent) in the city of Marquette.

ROI Population. Population in the ROI would increase from 103,322 at closure to 107,394 in 2000 and 118,951 in 2015 (see Table 4.3-4). The average annual rate of population growth in the ROI during this 20-year period would be 0.7 percent, compared to 0.5 percent for the closure

Table 4.3-4. Total Regional Population Effects - Counties and Selected Communities: International Wayport Alternative

	2000	2005	2015
ROI Population Projections			
With No-Action Alternative			
Marquette County	65,825	67,848	71,890
Forsyth Township	3,493	3,743	4,244
Sands Township	1,539	1,615	1,769
West Branch Township	708	772	900
City of Ishpeming	7,678	7,883	8,294
City of Marquette	22,887	23,514	24,767
City of Negaunee	4,990	5,125	5,396
Rest of County	24,530	25,196	26,520
Delta County	40,158	40,893	43,005
ROI Total	105,983	108,741	114,895
Migratory-Related Population Changes[a]			
Reuse Effects			
Marquette County	1,245	2,037	3,578
Forsyth Township	569	931	1,635
Sands Township	120	196	345
West Branch Township	78	128	225
City of Ishpeming	46	75	131
City of Marquette	189	310	544
City of Negaunee	66	108	190
Rest of County	177	289	508
Delta County	166	272	478
ROI Total	1,411	2,309	4,056
ROI Population Projections			
With Reuse			
Marquette County	67,070	69,885	75,468
Forsyth Township	4,062	4,674	5,879
Sands Township	1,659	1,811	2,114
West Branch Township	786	900	1,125
City of Ishpeming	7,724	7,958	8,425
City of Marquette	23,076	23,824	25,311
City of Negaunee	5,056	5,233	5,586
Rest of County	24,707	25,485	27,028
Delta County	40,324	41,165	43,483
ROI Total	107,394	111,050	118,951

Note: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.

ROI = Region of Influence

baseline. The projected ROI population trend compared to the closure baseline and the other reuse alternatives is presented in Figure 4.3-1.

4.3.3 Commercial Aviation Alternative

Site-Related Population. The total site-related population is projected to increase to 5,410 in 2000 and 11,981 in 2015 (Table 4.3-5). A total of 9,775 (81.6 percent) would reside in Marquette County by 2015, with 1,723 (14.4 percent) in Delta County, 4,120 (34.4 percent) in Forsyth Township, and 1,652 (13.8 percent) in the city of Marquette.

Table 4.3-5 Site-Related Population: Commercial Aviation Alternative

	2000	2005	2015
Persons by Labor Category of Employee			
Direct	3,251	5,274	7,381
Construction	202	152	163
Operations	3,049	5,122	7,218
Secondary	2,159	3,455	4,600
Total	5,410	8,729	11,981
Persons by Location			
Marquette County	4,406	7,113	9,775
Forsyth Township	1,849	2,987	4,120
Sands Township	396	639	881
West Branch Township	262	424	584
City of Ishpeming	194	312	426
City of Marquette	749	1,207	1,652
City of Negaunee	240	388	532
Rest of County	716	1,156	1,580
Delta County	787	1,267	1,723
ROI Total	5,193	8,380	11,498
Outside ROI	217	349	483
Total	5,410	8,729	11,981

Note: Site-related population represents all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

ROI = Region of Influence

Migratory-Related Population Change. The migratory-related population changes expected to occur due to the Commercial Aviation Alternative are shown in Table 4.3-6 for the ROI. Migratory-related population changes

Table 4.3-6. Total Regional Population Effects - Counties and Selected Communities: Commercial Aviation Alternative

	2000	2005	2015
ROI Population Projections			
With No-Action Alternative			
Marquette County	65,825	67,848	71,890
Forsyth Township	3,493	3,743	4,244
Sands Township	1,539	1,615	1,769
West Branch Township	708	772	900
City of Ishpeming	7,678	7,883	8,294
City of Marquette	22,887	23,514	24,767
City of Negaunee	4,990	5,125	5,396
Rest of County	24,530	25,196	26,520
Delta County	40,158	40,893	43,005
ROI Total	105,983	108,741	114,895
Migratory-Related Population Changes[a]			
Reuse Effects			
Marquette County	877	1,451	2,031
Forsyth Township	400	663	929
Sands Township	84	140	196
West Branch Township	55	91	128
City of Ishpeming	32	53	74
City of Marquette	134	221	308
City of Negaunee	47	77	108
Rest of County	125	206	288
Delta County	118	194	270
ROI Total	995	1,645	2,301
ROI Population Projections			
With Reuse			5
Marquette County	66,702	69,299	73,921
Forsyth Township	3,893	4,406	5,173
Sands Township	1,623	1,755	1,965
West Branch Township	763	863	1,028
City of Ishpeming	7,710	7,936	8,368
City of Marquette	23,021	23,735	25,075
City of Negaunee	5,037	5,202	5,504
Rest of County	24,655	25,402	26,808
Delta County	40,276	41,087	43,275
ROI Total	106,978	110,386	117,196

Note: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.

ROI = Region of Influence

caused by the Commercial Aviation Alternative are projected at 995 in 2000 and 2,301 in 2015. In 2015, 2,031 (88.3 percent of the ROI total) are expected to live in Marquette County, with 270 (11.7 percent) in Delta County, 929 (40.4 percent) in Forsyth Township, and 308 (13.4 percent) in the city of Marquette.

ROI Population. Population in the ROI would increase from 103,322 at closure to 106,978 in 2000 and 117,196 in 2015 (see Table 4.3-6). The average annual rate of population growth in the ROI during this 20-year period would be 0.6 percent, compared to 0.5 percent for the closure baseline. The projected ROI population trend compared to the closure baseline and the other reuse alternatives is presented in Figure 4.3-1.

4.3.4 Recreation Alternative

Site-Related Population. The total site-related population is projected to increase to 1,719 persons in 2000 and 4,117 in 2015 (Table 4.3-7). Nearly all of these persons would be associated with direct operations jobs and secondary employment. A total of 3,386 (82.2 percent) of these persons would reside in Marquette County, with 558 (13.6 percent) in Delta County, 1,459 (35.4 percent) in Forsyth Township, and 557 (13.5 percent) in the city of Marquette by 2015.

Migratory-Related Population Change. The migratory-related population changes expected to occur in the ROI are shown in Table 4.3-8. Migratory-related population changes projected to occur as a result of the Recreation Alternative are 351 persons in 2000 and 863 in 2015. It is projected that 764 (88.5 percent of the ROI total) would live in Marquette County, 99 (11.5 percent) in Delta County, 352 (40.8 percent) in Forsyth Township, and 115 (13.3 percent) in the city of Marquette by 2015.

ROI Population. With this alternative, population in the ROI would increase from 103,322 persons at closure to 106,334 in 2000 and 115,758 in 2015 (see Table 4.3-8). The average annual growth rate for population in the ROI during this 20-year period would be 0.6 percent, compared to 0.5 percent under closure baseline conditions. The trend in ROI population with the Recreation Alternative compared to the closure baseline and the other reuse alternatives is presented in Figure 4.3-1.

4.3.5 No-Action Alternative

Population effects under the No-Action Alternative would be similar to those described in Section 3.3 as closure conditions and as briefly highlighted in the introductory paragraph of this section.

Table 4.3-7. Site-Related Population: Recreation Alternative

	2000	2005	2015
Persons by Labor Category of Employee			
Direct	1,215	1,958	2,839
Construction	106	41	44
Operations	1,109	1,917	2,795
Secondary	504	816	1,278
Total	1,719	2,774	4,117
Persons by Location			
Marquette County	1,418	2,286	3,386
Forsyth Township	614	990	1,459
Sands Township	131	211	311
West Branch Township	86	139	205
City of Ishpeming	59	94	141
City of Marquette	232	374	557
City of Negaunee	76	123	183
Rest of County	220	355	530
Delta County	230	371	558
ROI Total	1,648	2,657	3,944
Outside ROI	71	117	173
Total	1,719	2,774	4,117

Note: Site-related population represents all direct and secondary workers and their dependents residing in the region. These include persons who are projected to live in the ROI without reuse and consequently are a combination of migratory-related population change and baseline population.

ROI = Region of Influence

4.4 HOUSING

Total nonseasonal housing demand in the ROI is estimated to be 36,466 units at closure. Following the population trend, housing demand is projected to increase to 40,536 units in 2015. This represents an average annual growth rate of 0.5 percent for this period, which is the same as the projected growth in population. The greatest demand for housing in the ROI is expected to occur under the Proposed Action.

4.4.1 Proposed Action

Migratory-Related Housing Demand. Housing demand caused by the Proposed Action associated with population in-migration is projected to be 869 units in the ROI in 2000 and 3,603 in 2015 (Table 4.4-1). A total of 3,173 units (88.1 percent) are projected in Marquette County, including

Table 4.3-8. Total Regional Population Effects - Counties and Selected Communities: Recreation Alternative
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	2000	2005	2015
ROI Population Projections			
With No-Action Alternative			
Marquette County	65,825	67,848	71,890
Forsyth Township	3,493	3,743	4,244
Sands Township	1,539	1,615	1,769
West Branch Township	708	772	900
City of Ishpeming	7,678	7,883	8,294
City of Marquette	22,887	23,514	24,767
City of Negaunee	4,990	5,125	5,396
Rest of County	24,530	25,196	26,520
Delta County	40,158	40,893	43,005
ROI Total	105,983	108,741	114,895
Migratory-Related Population Changes[a]			
Reuse Effects			
Marquette County	311	525	764
Forsyth Township	144	242	352
Sands Township	30	51	74
West Branch Township	20	33	48
City of Ishpeming	11	19	28
City of Marquette	47	79	115
City of Negaunee	16	28	40
Rest of County	43	73	107
Delta County	40	67	99
ROI Total	351	592	863
ROI Population Projections			
With Reuse			
Marquette County	66,136	68,373	72,654
Forsyth Township	3,637	3,985	4,596
Sands Township	1,569	1,666	1,843
West Branch Township	728	805	948
City of Ishpeming	7,689	7,902	8,322
City of Marquette	22,934	23,593	24,882
City of Negaunee	5,006	5,153	5,436
Rest of County	24,573	25,269	26,627
Delta County	40,198	40,960	43,104
ROI Total	106,334	109,333	115,758

Note: (a) Migratory-related population change represents those site-related employees and dependents living in the region who would not live in the region without reuse. All other site-related employees and dependents would live in the region without reuse of the base.

ROI = Region of Influence

Table 4.4-1. Total Regional Housing Effects - Counties and Selected Communities (number of housing units): Proposed Action

	2000	2005	2015
ROI Housing Demand			
With No-Action Alternative			
Marquette County	22,723	23,421	24,816
Forsyth Township	937	1,004	1,138
Sands Township	429	450	493
West Branch Township	656	716	834
City of Ishpeming	3,108	3,192	3,358
City of Marquette	8,007	8,226	8,665
City of Negaunee	1,978	2,032	2,139
Rest of County	7,608	7,801	8,189
Delta County	14,679	14,947	15,720
ROI Total	37,402	38,368	40,536
Migratory-Related Housing Demand[a]			
Reuse Demand			
Marquette County	765	1,518	3,173
Forsyth Township	348	691	1,445
Sands Township	74	146	305
West Branch Township	48	96	199
City of Ishpeming	28	56	118
City of Marquette	117	232	485
City of Negaunee	41	81	168
Rest of County	109	216	453
Delta County	104	205	430
ROI Total	869	1,723	3,603
ROI Housing Demand			
With Reuse			
Marquette County	23,488	24,939	27,989
Forsyth Township	1,285	1,695	2,583
Sands Township	503	596	798
West Branch Township	704	812	1,033
City of Ishpeming	3,136	3,248	3,476
City of Marquette	8,124	8,458	9,150
City of Negaunee	2,019	2,113	2,307
Rest of County	7,717	8,017	8,642
Delta County	14,783	15,152	16,150
ROI Total	38,271	40,091	44,139

Note: (a) Migratory-related housing demand is attributable to migratory-related ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

ROI = Region of Influence

1,445 (40.1 percent) in Forsyth Township and 485 (13.5 percent) in the city of Marquette. Delta County would experience an increase in demand of 430 units (11.9 percent).

ROI Housing Demand. Total nonseasonal housing demand under the Proposed Action is projected to increase from 36,466 units at closure to 38,271 in 2000 and 44,139 in 2015 (see Table 4.4-1). The growth rate in housing demand averages 1.0 percent per year for this 20-year period, compared to 0.5 percent under closure baseline conditions.

4.4.2 International Wayport Alternative

Migratory-Related Housing Demand. Housing demand caused by the International Wayport Alternative associated with population in-migration is projected to be 485 units in the ROI in 2000 and 1,394 in 2015 (Table 4.4-2). A total of 1,230 units (88.2 percent) are projected in Marquette County, including 562 (40.3 percent) in Forsyth Township and 187 (13.4 percent) in the city of Marquette. Delta County would experience an increase in demand of 164 units (11.8 percent).

ROI Housing Demand. Total nonseasonal housing demand under the International Wayport Alternative is projected to increase from 36,466 units at closure to 37,887 in 2000 and 41,930 in 2015 (see Table 4.4-2). The growth rate in housing demand averages 0.7 percent per year for this 20-year period, compared to 0.5 percent under closure baseline conditions.

4.4.3 Commercial Aviation Alternative

Migratory-Related Housing Demand. Housing demand caused by the Commercial Aviation Alternative associated with population in-migration is projected to be 342 units in the ROI in 2000 and 791 in 2015 (Table 4.4-3). A total of 698 units (88.2 percent) are projected in Marquette County, including 319 (40.3 percent) in Forsyth Township and 106 (13.4 percent) in the city of Marquette. Delta County would experience an increase in demand of 93 units (11.8 percent).

ROI Housing Demand. Total nonseasonal housing demand under the Commercial Aviation Alternative is projected to increase from 36,466 units at closure to 37,744 in 2000 and 41,327 in 2015 (see Table 4.4-3). The growth rate in housing demand averages 0.6 percent per year for this 20-year period, compared to 0.5 percent under closure baseline conditions.

4.4.4 Recreation Alternative

Migratory-Related Housing Demand. Housing demand created by population in-migration associated with the Recreation Alternative is projected to be 121 units in the ROI in 2000 and 297 in 2015 (Table 4.4-4). A total of 263

Table 4.4-2. Total Regional Housing Effects - Counties and Selected Communities (number of housing units): International Wayport Alternative

	2000	2005	2015
ROI Housing Demand			
With No-Action Alternative			
Marquette County	22,723	23,421	24,816
Forsyth Township	937	1,004	1,138
Sands Township	429	450	493
West Branch Township	656	716	834
City of Ishpeming	3,108	3,192	3,358
City of Marquette	8,007	8,226	8,665
City of Negaunee	1,978	2,032	2,139
Rest of County	7,608	7,801	8,189
Delta County	14,679	14,947	15,720
ROI Total	37,402	38,368	40,536
Migratory-Related Housing Demand[a]			
Reuse Demand			
Marquette County	428	700	1,230
Forsyth Township	196	320	562
Sands Township	41	67	119
West Branch Township	27	44	77
City of Ishpeming	16	26	45
City of Marquette	65	107	187
City of Negaunee	23	37	65
Rest of County	60	99	175
Delta County	57	93	164
ROI Total	485	793	1,394
ROI Housing Demand			
With Reuse			
Marquette County	23,151	24,121	26,046
Forsyth Township	1,133	1,324	1,700
Sands Township	470	517	612
West Branch Township	683	760	911
City of Ishpeming	3,124	3,218	3,403
City of Marquette	8,072	8,333	8,852
City of Negaunee	2,001	2,069	2,204
Rest of County	7,668	7,900	8,364
Delta County	14,736	15,040	15,884
ROI Total	37,887	39,161	41,930

Note: (a) Migratory-related housing demand is attributable to migratory-related ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

ROI = Region of Influence

Table 4.4-3. Total Regional Housing Effects - Counties and Selected Communities (number of housing units): Commercial Aviation Alternative

	2000	2005	2015
ROI Housing Demand			
With No-Action Alternative			
Marquette County	22,723	23,421	24,816
Forsyth Township	937	1,004	1,138
Sands Township	429	450	493
West Branch Township	656	716	834
City of Ishpeming	3,108	3,192	3,358
City of Marquette	8,007	8,226	8,665
City of Negaunee	1,978	2,032	2,139
Rest of County	7,608	7,801	8,189
Delta County	14,679	14,947	15,720
ROI Total	37,402	38,368	40,536
Migratory-Related Housing Demand[a]			
Reuse Demand			
Marquette County	301	499	698
Forsyth Township	137	228	319
Sands Township	29	48	67
West Branch Township	19	31	44
City of Ishpeming	11	18	25
City of Marquette	46	76	106
City of Negaunee	16	26	37
Rest of County	43	72	100
Delta County	41	67	93
ROI Total	342	566	791
ROI Housing Demand			
With Reuse			
Marquette County	23,024	23,920	25,514
Forsyth Township	1,074	1,232	1,457
Sands Township	458	498	560
West Branch Township	675	747	878
City of Ishpeming	3,119	3,210	3,383
City of Marquette	8,053	8,302	8,771
City of Negaunee	1,994	2,058	2,176
Rest of County	7,651	7,873	8,289
Delta County	14,720	15,014	15,813
ROI Total	37,744	38,934	41,327

Note: (a) Migratory-related housing demand is attributable to migratory-related ROI population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

ROI = Region of Influence

Table 4.4-4. Total Regional Housing Effects - Counties and Selected Communities (number of housing units): Recreation Alternative

	2000	2005	2015
ROI Housing Demand			
With No-Action Alternative			
Marquette County	22,723	23,421	24,816
Forsyth Township	937	1,004	1,138
Sands Township	429	450	493
West Branch Township	656	716	834
City of Ishpeming	3,108	3,192	3,358
City of Marquette	8,007	8,226	8,665
City of Negaunee	1,978	2,032	2,139
Rest of County	7,608	7,801	8,189
Delta County	14,679	14,947	15,720
ROI Total	37,402	38,368	40,536
Migratory-Related Housing Demand[a]			
Reuse Demand			
Marquette County	107	180	263
Forsyth Township	49	83	121
Sands Township	10	18	25
West Branch Township	7	11	16
City of Ishpeming	4	7	10
City of Marquette	16	27	40
City of Negaunee	5	10	14
Rest of County	16	24	37
Delta County	14	23	34
ROI Total	121	203	297
ROI Housing Demand			
With Reuse			
Marquette County	22,830	23,601	25,079
Forsyth Township	986	1,087	1,259
Sands Township	439	468	518
West Branch Township	663	727	850
City of Ishpeming	3,112	3,199	3,368
City of Marquette	8,023	8,253	8,705
City of Negaunee	1,983	2,042	2,153
Rest of County	7,624	7,825	8,226
Delta County	14,693	14,970	15,754
ROI Total	37,523	38,571	40,833

Note: (a) Migratory-related housing demand is attributable to ROI migratory-related population changes. It reflects the change in housing demand, compared to baseline conditions, required to house the change in ROI population caused by reuse.

ROI = Region of Influence

units (88.6 percent) are projected in Marquette County, including 121 (40.7 percent) in Forsyth Township and 40 (13.5 percent) in the city of Marquette. Delta County would experience an increase in demand of 34 units (11.4 percent).

ROI Housing Demand. Total year-round housing demand under the Recreation Alternative is projected to increase from 36,466 units at closure to 37,523 in 2000 and 40,833 in 2015 (see Table 4.4-4). The growth rate in housing demand averages 0.6 percent per year for this period, compared to 0.5 percent under closure baseline conditions.

4.4.5 No-Action Alternative

Housing effects under the No-Action Alternative would be similar to those described in Section 3.4 as closure conditions and as briefly highlighted in the introductory paragraph of this section.

4.5 PUBLIC SERVICES

Effects to key local public services are determined by the change in demand for service personnel and facilities arising from project implementation. The ability to accommodate increased demand or to respond to decreases in demand, while maintaining accustomed levels of local public service, is examined based on potential changes in demand for services.

Public services would be affected by ROI population in-migration. The number of in-migrating workers at the site, their accompanying dependents, and their settlement patterns would affect public service demand throughout the ROI. Preclosure per capita-generated demand for public services for 1990 (i.e., student/teacher ratios and ratios of governmental/health care employees per 1,000 population) were used as standards of service requirements. Potential project effects were determined by the addition of public service employees (e.g., municipal employees, school teaching staff, police officers, fire fighters, health care providers) required to serve the resulting in-migrating population. Staffing-to-population service ratios are used to compare effects between the alternatives only, and are not intended to suggest future staffing requirements.

Based on the expected growth pattern associated with reuse, public service effects were projected for those jurisdictions that would be most affected by changes in service demand. These jurisdictions include Marquette County; the townships of Forsyth, Sands, and West Branch; the city of Marquette; the Gwinn Area Community Schools; and the Marquette Area Public Schools.

Other direct effects would focus on increased service demand resulting from additional area and infrastructure arising from the shift from the federal

administration of K. I. Sawyer AFB to local jurisdictions. Following disposition of any parcel to the private sector, Marquette County and the three townships of Forsyth, Sands, and West Branch would become responsible for serving the demand for municipal services, police protection, fire protection, and health care over the base. Also, local service providers would lose Air Force support in the form of mutual aid agreements (e.g., for fire protection). The Proposed Action would have the greatest effect on public services.

4.5.1 Local Government

Potential effects to local government structure and employment are examined for each alternative. The analysis considers project-related population in-migration and changes in service area infrastructure responsibility resulting under each alternative. Due to the magnitude of some effects of closure and reuse, level-of-service ratios may not adequately meet new service requirements. Changes in land area served and types of services to be provided were considered. All numbers of personnel are expressed as full-time equivalents.

Area-Generated Employee Demand. The site is located in Marquette County within the Forsyth, Sands, and West Branch townships. Planning, public works, utilities, building code inspection and enforcement, recreation, and other social services may need to be expanded in these jurisdictions for the additional area and infrastructure requirements.

Based on the 1992 area-generated level-of-service ratio of 0.22 employee per square mile, Marquette County could require an increase of up to two employees to serve the additional 7.7 square miles of the base. The 2.4 square miles, 4.8 square miles, and 0.5 square mile added to the Forsyth, Sands, and West Branch townships, respectively, would not require an increase in employment to serve the additional areas. These effects would apply to all reuse alternatives. The total local government employee demands would be the summation of per capita demands and area-generated demands.

With K. I. Sawyer AFB closed and in caretaker status (the No-Action Alternative), OL activities would not generate new demand for local government services. As a result, municipal staffing levels would not have to be increased for any of the local jurisdictions. Effects of each of the reuse alternatives are compared to these closure baseline conditions.

4.5.1.1 Proposed Action

Marquette County. Based on per capita calculations, Marquette County would experience the greatest increase in demand for government service in the region. Under the Proposed Action, Marquette County would experience

a population increase of 2,226 persons by 2000 and 9,233 by 2015, or approximately 88.1 percent of the total population change due to in-migration to the ROI in 2015. To maintain the 1992 level-of-service ratio of 6.2 county employees per 1,000 persons living off base, employment would increase by 14 employees by 2000 and 57 by 2015 (Table 4.5-1). These increases in county employees by 2015 represent a 14.7-percent increase over the closure staffing level of 387 employees.

Table 4.5-1. Local Government Employment Effects: Proposed Action

	2000	2005	2015
Marquette County	14	27	57
Forsyth Township	3	7	14
Sands Township	0	1	1
West Branch Township	0	1	1
City of Marquette	3	6	13
Total	20	42	86

Note: Effects of migratory-related population changes on local government employment requirements are shown cumulatively. Teachers, police officers, and fire fighters are analyzed separately. Area-generated employee demand is not included in this table.

Forsyth Township. Forsyth Township would experience a population increase of 1,014 persons by 2000 and 4,205 by 2015, or 40.1 percent of the total increase in population due to in-migration to the ROI. This would generate a per capita increase in public service employment requirements of 3 additional employees by 2000 and 14 by 2015 to maintain the 1992 level-of-service ratio of 3.3 township employees per 1,000 persons (see Table 4.5-1). In 2015, this represents a 140.0 percent increase over the closure staffing level of ten employees.

Sands Township. Based on in-migration of 214 persons by 2000 and 887 by 2015, no additional employees would be required in Sands Township by 2000, but one additional employee would be required by 2015 to maintain the 1992 level-of-service ratio of 1.6 employees per 1,000 persons (see Table 4.5-1). This represents a 33.3 percent increase over the closure staffing level of three employees.

West Branch Township. In-migration to West Branch Township would total 140 persons by 2000 and 580 by 2015. Using a 1992 staffing level of 2.2 employees per 1,000 persons, no additional employees would need to be added by 2000, but one additional employee would be required by 2015 under the Proposed Action (see Table 4.5-1). This represents a 50.0-percent increase over the closure staffing level of two employees.

City of Marquette. To meet increased service demands generated by a projected in-migrating population of 340 persons by 2000 and 1,412 by 2015, while maintaining the 1992 level-of-service ratio of 9.1 employees per 1,000 persons, 3 additional employees would be required by 2000 and 13 by 2015 (see Table 4.5-1). Compared to the closure level staffing, this would represent a 6.6-percent increase by 2015.

4.5.1.2 International Wayport Alternative

Marquette County. Under this alternative, Marquette County would experience a population increase of 1,245 persons by 2000 and 3,578 by 2015. To maintain the 1992 level-of-service ratio of 6.2 county employees per 1,000 persons living off base, increases in employment by the county would be 8 employees by 2000 and 22 by 2015 (Table 4.5-2). These increases in county employees by 2015 represent a 5.7-percent increase in staffing over the closure level.

Table 4.5-2. Local Government Employment Effects: International Wayport Alternative

	2000	2005	2015
Marquette County	8	13	22
Forsyth Township	2	3	5
Sands Township	0	0	1
West Branch Township	0	0	0
City of Marquette	2	3	5
Total	12	19	33

Note: Effects of migratory-related population changes on local government employment requirements are shown cumulatively. Teachers, police officers, and fire fighters are analyzed separately. Area-generated employee demand is not included in this table.

Forsyth Township. Forsyth Township would experience a population increase of 569 persons by 2000 and 1,635 by 2015. This would generate a per capita increase in public service employment requirements of two additional employees by 2000 and five by 2015 to maintain the 1992 level-of-service ratio of 3.3 township employees per 1,000 persons (see Table 4.5-2). This is a 50.0-percent increase over the closure staffing level by 2015.

Sands Township. Based on in-migration of 120 persons by 2000 and 345 by 2015, no additional employees would be required in Sands Township by 2000, but one additional employee would be required by 2015 to maintain the 1992 level-of-service ratio of 1.6 employees per 1,000 persons (see Table 4.5-2). This is a 33.3-percent increase over the closure staffing level.

West Branch Township. In-migration to West Branch Township would total 78 persons by 2000 and 225 by 2015. Using a 1992 staffing level of 2.2 county employees per 1,000 persons, no additional employees would be required under this alternative (see Table 4.5-2).

City of Marquette. To maintain the level-of-service ratio of 9.1 employees per 1,000 persons, two additional employees would be required by 2000 and five by 2015 to meet increased service demands generated by an in-migrating population of 189 by 2000 and 544 by 2015 (see Table 4.5-2). Compared to the closure staffing level, this alternative would generate a 2.5-percent increase by 2015.

4.5.1.3 Commercial Aviation Alternative

Marquette County. Under this alternative, Marquette County would experience a population increase of 877 persons by 2000 and 2,031 by 2015. To maintain the 1992 level-of-service ratio of 6.2 county employees per 1,000 persons living off base, increases in employment by the county would be 5 employees by 2000 and 13 by 2015 (Table 4.5-3). These increases in county employees by 2015 represent a 3.4-percent increase over the closure staffing levels.

Table 4.5-3. Local Government Employment Effects: Commercial Aviation Alternative

	2000	2005	2015
Marquette County	5	9	13
Forsyth Township	1	2	3
Sands Township	0	0	0
West Branch Township	0	0	0
City of Marquette	1	2	3
Total	7	13	19

Note: Effects of migratory-related population changes on local government employment requirements are shown cumulatively. Teachers, police officers, and fire fighters are analyzed separately. Area-generated employee demand is not included in this table.

Forsyth Township. Forsyth Township would experience a population increase of 400 persons by 2000 and 929 by 2015. This would generate a per capita increase in public service employment requirements of one additional employee by 2000 and three by 2015 to maintain the 1992 level-of-service ratio of 3.3 township employees per 1,000 persons (see Table 4.5-3). This is a 30.0-percent increase over the closure staffing level by 2015.

Sands Township. Based on in-migration of 84 persons by 2000 and 196 by 2015, no additional employees would be required in Sands Township to maintain the 1992 level-of-service ratio of 1.6 employees per 1,000 persons (see Table 4.5-3).

West Branch Township. In-migration to West Branch Township would total 55 persons by 2000 and 128 by 2015. Using a 1992 staffing level of 2.2 employees per 1,000 persons, no additional employees would need to be added under this alternative (see Table 4.5-3).

City of Marquette. To maintain the level-of-service ratio of 9.1 employees per 1,000 persons, one additional employee would be required by 2000 and three by 2015 to meet increased service demands generated by an in-migrating population of 134 persons by 2000 and 308 by 2015 (see Table 4.5-3). Compared to the closure staffing level, this alternative would generate a 1.5-percent increase by 2015.

4.5.1.4 Recreation Alternative

Marquette County. Under this alternative, Marquette County would experience a population increase of 311 persons by 2000 and 764 by 2015. To maintain the 1992 service level, increases in employment by the county would be two employees by 2000 and five by 2015 (Table 4.5-4). These additional employees represent a 1.3-percent increase by 2015 over the closure staffing level.

Table 4.5-4. Local Government Employment Effects: Recreation Alternative

	2000	2005	2015
Marquette County	2	3	5
Forsyth Township	0	1	1
Sands Township	0	0	0
West Branch Township	0	0	0
City of Marquette	0	1	1
Total	2	5	7

Note: Effects of migratory-related population changes on local government employment requirements are shown cumulatively. Teachers, police officers, and fire fighters are analyzed separately. Area-generated employee demand is not included in this table.

Forsyth Township. Forsyth Township would experience a population increase of 144 persons by 2000 and 352 by 2015. This would not generate an increase in employment by 2000; however, one additional employee would be required by 2015 to maintain the 1992 level-of-service ratio (see Table 4.5-4). This is a 10.0-percent increase over the closure staffing level.

Sands Township. To maintain the 1992 level of service, no additional staffing would be required to accommodate an in-migrating population of 30 persons by 2000 and 74 by 2015 (see Table 4.5-4).

West Branch Township. In-migration to West Branch Township would total 20 persons by 2000 and 48 by 2015. Using a 1992 staffing level, no additional employees would have to be added under this alternative (see Table 4.5-4).

City of Marquette. To maintain the 1992 level of service, no additional employees would be required by 2000 and one additional employee would be required by 2015 to meet increased service demands generated by an in-migrating population of 47 persons by 2000 and 115 by 2015 (see Table 4.5-4). Compared to the closure staffing level, this alternative would generate a 0.5-percent increase.

4.5.1.5 No-Action Alternative. Local government employment effects under the No-Action Alternative would be similar to those described in Section 3.5 as closure conditions.

4.5.2 Public Education

Potential effects to education services and facilities are examined for each alternative. The analysis considers project-related population change and its effect on local enrollment and teaching staff strengths.

The school facilities of the Gwinn Area Community Schools and Marquette Area Public Schools have sufficient capacity to accommodate the in-migrating students projected under all of the alternatives.

The 1992 student/teacher ratios of 16.2 for the Gwinn Area Community Schools and 21.1 for the Marquette Area Public Schools were maintained in the projections of teacher requirements for the alternatives.

4.5.2.1 Proposed Action

Gwinn Area Community Schools. With implementation of the Proposed Action, student enrollment in the Gwinn Area Community Schools is projected to increase by 278 in 2000 and 1,154 in 2015 (Table 4.5-5). Compared to the estimated enrollment level of 1,300 students at closure, the district would increase by 88.8 percent.

The number of teachers needed to serve the additional enrollment projected under the Proposed Action would be 17 by 2000 and 71 by 2015, assuming the 1992 student/teacher ratio is maintained. By 2015, the additional teachers represent an 88.8-percent increase over the estimated staffing level of 80 at closure.

Table 4.5-5. Enrollment and Teaching Staff Effects: Proposed Action

	2000	2005	2015
Student Enrollment Effects			
Gwinn Area Community Schools	278	552	1,154
Marquette Area Public Schools	60	118	247
Total	338	670	1,401
Teaching Staff Effects			
Gwinn Area Community Schools	17	34	71
Marquette Area Public Schools	3	6	12
Total	20	40	83

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements are shown cumulatively.

Marquette Area Public Schools. Student enrollment in the Marquette Area Public Schools is projected to increase by 60 in 2000 and 247 in 2015 (see Table 4.5-5). By 2015, enrollment will have increased due to the Proposed Action by 5.1 percent over the 4,848 students at closure.

With the additional enrollment, teaching staff would increase by 3 in 2000 and 12 in 2015 to maintain the 1992 student/teacher ratio. By 2015, the additional teachers represent a 5.2-percent increase over the closure level of 230.

4.5.2.2 International Wayport Alternative

Gwinn Area Community Schools. With implementation of this alternative, student enrollment in the Gwinn Area Community Schools is projected to increase by 156 in 2000 and 449 in 2015 (Table 4.5-6). Compared to the estimated enrollment level at closure, the district would increase by 34.5 percent.

The number of teachers needed to serve the additional enrollment projected under this alternative would be 10 by 2000 and 28 by 2015, assuming the 1992 student/teacher ratio is maintained. By 2015, the additional teachers represent a 35.0-percent increase over the estimated staffing level at closure.

Marquette Area Public Schools. Student enrollment in the Marquette Area Public Schools is projected to increase by 33 in 2000 and 95 in 2015 (see Table 4.5-6). By 2015, the district enrollment is projected to increase due to this alternative by 2.0 percent over the estimated enrollment level at closure.

With the additional enrollment, teaching staff would increase by two in 2000 and five in 2015 to maintain the 1992 student/teacher ratio. The

Table 4.5-6. Enrollment and Teaching Staff Effects: International Wayport Alternative

	2000	2005	2015
Student Enrollment Effects			
Gwinn Area Community Schools	156	255	449
Marquette Area Public Schools	33	54	95
Total	189	309	544
Teaching Staff Effects			
Gwinn Area Community Schools	10	16	28
Marquette Area Public Schools	2	3	5
Total	12	19	33

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements are shown cumulatively.

additional teachers needed in the long term would increase the staffing in the district by 2.2 percent over the closure level.

4.5.2.3 Commercial Aviation Alternative

Gwinn Area Community Schools. With implementation of this alternative, student enrollment in the Gwinn Area Community Schools is projected to increase by 110 in 2000 and 255 in 2015 (Table 4.5-7). Compared to the estimated enrollment level at closure, the district enrollment would increase by 19.6 percent.

Table 4.5-7. Enrollment and Teaching Staff Effects: Commercial Aviation Alternative

	2000	2005	2015
Student Enrollment Effects			
Gwinn Area Community Schools	110	182	255
Marquette Area Public Schools	23	39	54
Total	133	221	309
Teaching Staff Effects			
Gwinn Area Community Schools	7	11	16
Marquette Area Public Schools	1	2	3
Total	8	13	19

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements are shown cumulatively.

The number of teachers needed to serve the additional enrollment projected under this alternative would be 7 by 2000 and 16 by 2015, assuming the

1992 student/teacher ratio is maintained. By 2015, the additional teachers represent a 20.0-percent increase over the estimated staffing level at closure.

Marquette Area Public Schools. Student enrollment in the Marquette Area Public Schools is projected to increase by 23 in 2000 and 54 in 2015 (see Table 4.5-7). By 2015, the district enrollment is projected to increase due to this alternative by 1.1 percent over the estimated enrollment level at closure.

With the additional enrollment, teaching staff would increase by one in 2000 and three in 2015 to maintain the 1992 student/teacher ratio. The additional teachers needed in the long term would increase the staffing in the district by 1.3 percent over the closure level.

4.5.2.4 Recreation Alternative

Gwinn Area Community Schools. Student enrollment under the Recreation Alternative is projected to increase in the Gwinn Area Community Schools by 40 in 2000 and 96 in 2015 (Table 4.5-8). The additional students who could be added by 2015 represent a 7.4-percent increase over total enrollment at closure.

Table 4.5-8. Enrollment and Teaching Staff Effects: Recreation Alternative

	2000	2005	2015
Student Enrollment Effects			
Gwinn Area Community Schools	40	66	96
Marquette Area Public Schools	8	14	20
Total	48	80	116
Teaching Staff Effects			
Gwinn Area Community Schools	2	4	6
Marquette Area Public Schools	0	1	1
Total	2	5	7

Note: Effects of migratory-related population changes on student enrollments and teaching staff requirements are shown cumulatively.

Associated increases in teaching staff would be two by 2000 and six by 2015 to maintain the 1992 student/teacher ratio. The additional teachers by 2015 would represent a 7.5-percent increase over the staffing level at closure.

Marquette Area Public Schools. Student enrollment in the Marquette Area Public Schools is projected to increase by 8 in 2000 and 20 in 2015 (see Table 4.5-8). By 2015, the enrollment would increase due to the Recreation Alternative by 0.4-percent over the estimated enrollment at closure.

No additional teachers would be required by 2000 and one would be required by 2015 to maintain the 1992 student/teacher ratio. The additional teacher would represent a 0.4 percent increase over the closure staffing level.

4.5.2.5 No-Action Alternative. Public education effects of the No-Action Alternative would be the same as those described in Section 3.5.2 as closure conditions.

4.5.3 Police Protection

Under each alternative, potential effects to police protection services are examined based on migratory-related population, increase in geographic area covered, and types of services to be provided.

Area-Generated Police Demands. Police protection for the site would become the responsibility of the Forsyth Township Police Department, the Marquette County Sheriff's Department, and the Michigan State Police, which together provide police protection for Sands and West Branch townships. Forsyth Township Police Department employs 0.04 sworn officer per square mile, and the Sheriff's Department and State Police each employ 0.01 officer per square mile in Marquette County. Based on these 1992 level of service ratios, the police agencies would not require any additional officers to serve the 7.7-square-mile site under the reuse alternatives.

Under closure baseline conditions, the base would be in caretaker status (No-Action Alternative) and the site would be patrolled by an OL security contractor. Mutual aid law enforcement support would be provided by the Michigan State Police, the Marquette County Sheriff's Department, and the Forsyth Township Police Department.

4.5.3.1 Proposed Action

Michigan State Police. Under the Proposed Action, the Michigan State Police at the Negaunee Post would require one additional state trooper by 2000 and three by 2015 to meet increased demand due to projected in-migration of 2,226 and 9,233 persons countywide (Table 4.5-9). The 1992 level-of-service ratio of 0.3 trooper per 1,000 persons in the county could be maintained with this increase of 20.0 percent by 2015 over the closure staffing level of 15 troopers.

Marquette County Sheriff's Department. The Marquette County Sheriff's Department is not projected to require any additional sworn officers by 2000, but would require two by 2015 to meet additional service demands created by the in-migration of 2,226 and 9,233 persons to the county under

Table 4.5-9. Police Protection Effects: Proposed Action

	2000	2005	2015
Michigan State Police	1	1	3
Marquette County Sheriff's Department	0	1	2
Forsyth Township Police Department	1	3	5
City of Marquette Police Department	1	1	2
Total	3	6	12

Note: Effects of migratory-related population changes on number of sworn officers required are shown cumulatively. Does not include area-generated demands.

the Proposed Action (see Table 4.5-9). Maintaining the 1992 level-of-service ratio of 0.2 officer per 1,000 persons in the county would require this increase of 14.3 percent by 2015 over the closure staffing level of 14 officers.

Forsyth Township Police Department. Based on projected in-migration of 1,014 persons to Forsyth Township by 2000 and 4,205 by 2015, the Forsyth Township Police Department would require one additional sworn officer in 2000 and five by 2015 under the Proposed Action (see Table 4.5-9). The additional officers represent a 125.0-percent increase over the closure staffing level of four officers, and would maintain the 1992 level-of-service ratio of 1.3 officers per 1,000 persons.

City of Marquette Police Department. The Proposed Action would result in the in-migration of 340 residents to the city of Marquette by 2000 and 1,412 by 2015. This in-migration would require one additional sworn officer by 2000 and two by 2015 to maintain the level-of-service ratio of 1.5 officers per 1,000 persons (see Table 4.5-9). This represents an increase of 6.1-percent over the closure staffing level of 33 officers.

4.5.3.2 International Wayport Alternative

Michigan State Police. Under the International Wayport Alternative, the Michigan State Police at the Negaunee Post would require no additional state troopers by 2000 and one by 2015 to meet increased demand due to projected in-migration of 1,245 and 3,578 persons countywide (Table 4.5-10). The 1992 level-of-service ratio of 0.3 trooper per 1,000 persons in the county could be maintained with this increase of 6.7 percent by 2015 over the closure staffing level .

Marquette County Sheriff's Department. The Marquette County Sheriff's Department is projected to require no additional sworn officers by 2000 and one by 2015 to meet additional service demands created by the in-migration of 1,245 and 3,578 persons to the county under the International Wayport Alternative (see Table 4.5-10). Maintaining the 1992 level-of-service ratio

Table 4.5-10. Police Protection Effects: International Wayport Alternative

	2000	2005	2015
Michigan State Police	0	1	1
Marquette County Sheriff's Department	0	0	1
Forsyth Township Police Department	1	1	2
City of Marquette Police Department	0	0	1
Total	1	2	5

Note: Effects of migratory-related population changes on number of sworn officers required are shown cumulatively. Does not include area-generated demands.

of 0.2 officer per 1,000 persons in the county would require this 7.1-percent increase by 2015 over the closure staffing level.

Forsyth Township Police Department. Based on projected in-migration of 569 persons to Forsyth Township by 2000 and 1,635 by 2015, the Forsyth Township Police Department would require one additional sworn officer in 2000 and two by 2015 under the International Wayport Alternative (see Table 4.5-10). The additional officers would represent a 50.0-percent increase over the closure staffing level, and would maintain the 1992 level-of-service ratio of 1.3 officers per 1,000 persons.

City of Marquette Police Department. The International Wayport Alternative would result in the in-migration of 189 new residents to the city of Marquette by 2000 and 544 by 2015. No additional officers would be required until 2015, when one additional officer would retain the level-of-service ratio of 1.5 officers per 1,000 persons (see Table 4.5-10). This represents an increase of 3.0 percent over the closure staffing level.

4.5.3.3 Commercial Aviation Alternative

Michigan State Police. Under the Commercial Aviation Alternative, the Michigan State Police would require no additional state troopers at the Negaunee Post by 2000 but would require one additional trooper by 2015 to meet increased demand due to projected in-migration of 877 and 2,031 persons countywide (Table 4.5-11). The additional trooper would represent a 6.7-percent increase by 2015 over the closure staffing level and would maintain the 1992 level-of-service ratio of 0.3 trooper per 1,000 persons in the county.

Marquette County Sheriff's Department. The Marquette County Sheriff's Department is projected to require no additional sworn officers to meet additional service demands created by the in-migration of 877 persons to the county by 2000 and 2,031 by 2015 under the Commercial Aviation

Table 4.5-11. Police Protection Effects: Commercial Aviation Alternative

	2000	2005	2015
Michigan State Police	0	0	1
Marquette County Sheriff's Department	0	0	0
Forsyth Township Police Department	1	1	1
City of Marquette Police Department	0	0	0
Total	1	1	2

Note: Effects of migratory-related population changes on number of sworn officers required are shown cumulatively. Does not include area-generated demands.

Alternative (see Table 4.5-11). The 1992 level-of-service ratio of 0.2 officer per 1,000 persons in the county could be maintained.

Forsyth Township Police Department. Based on projected in-migration of 400 persons to Forsyth Township by 2000 and 929 by 2015, the Forsyth Township Police Department would require one additional sworn officer through 2015 under the Commercial Aviation Alternative (see Table 4.5-11). The additional officer would represent a 25.0-percent increase over the closure staffing level to maintain the 1992 level-of-service ratio of 1.3 officers per 1,000 persons.

City of Marquette Police Department. The Commercial Aviation Alternative would result in the in-migration of 134 new residents to the city of Marquette by 2000 and 308 by 2015. No additional officers would be required to retain the level-of-service ratio of 1.5 officers per 1,000 persons (see Table 4.5-11).

4.5.3.4 Recreation Alternative

Michigan State Police. Under the Recreation Alternative, the Michigan State Police would require no additional troopers at the Negaunee Post to meet increased demand due to projected population in-migration. The 1992 level of service would be maintained with the closure staffing level.

Marquette County Sheriff's Department. The Marquette County Sheriff's Department is not projected to require additional sworn officers by 2015 to meet the additional service demand created by population in-migration. The 1992 level-of-service ratio of 0.2 officer per 1,000 persons could be maintained with no increase over the closure staffing level.

Forsyth Township Police Department. In-migration by 2015 under the Recreation Alternative would not require an increase in the staffing level of the Forsyth Township Police Department. The 1992 level-of-service ratio of 1.3 sworn officers per 1,000 persons could be maintained with no increase in officers over the closure staffing level.

City of Marquette Police Department. Based on the projected in-migration by 2015, no increase in sworn officers by the Marquette Police Department would be required over the closure staffing level to maintain the 1992 level-of-service ratio of 1.5 officers per 1,000 persons.

4.5.3.5 No-Action Alternative. Police protection effects of the No-Action Alternative are the same as those described in Section 3.5.3 as closure conditions.

4.5.4 Fire Protection

Under each alternative, potential effects to fire protection services are examined based on migratory-related population, service area changes, and infrastructure responsibility changes.

Area-Generated Fire Fighters. If K. I. Sawyer AFB property is conveyed, responsibility for fire protection would be assumed by the three townships containing portions of the site. In Sands Township, based on the 1992 level-of-service ratio of 0.49 fire fighter per square mile of service area, the fire department could require two additional fire fighters. No additional area-generated fire fighters would be needed by the Forsyth Township Fire Department or Skandia-West Fire Department. These effects would be the same under each of the reuse alternatives.

With K. I. Sawyer AFB closed and in caretaker status (No-Action Alternative), an OL fire protection team would operate at the site. It is assumed that the Forsyth Township, Sands Township, and Skandia-West Branch fire departments would provide mutual aid fire protection support.

4.5.4.1 Proposed Action

Forsyth Township Fire Department. Under the Proposed Action, the Forsyth Township Fire Department is projected to require 6 additional fire fighters by 2000 and 24 by 2015 (Table 4.5-12) to maintain the 1992 level-of-service ratio of 5.8 fire fighters per 1,000 persons due to in-migration of 1,014 and 4,205 residents, respectively. In comparison to the closure staffing level of 17 fire fighters, the Proposed Action would increase the number of fire fighters by 141.2 percent by 2015.

Sands Township Fire Department. The Sands Township Fire Department would require 4 additional fire fighters by 2000 and 16 by 2015 due to in-migration of 214 and 887 residents under the Proposed Action (see Table 4.5-12). This increase would maintain the 1992 level-of-service ratio of 17.8 fire fighters per 1,000 persons. The 16 additional fire fighters by 2015 would increase staff levels by 64.0 percent over the 25 fire fighters remaining after closure.

Table 4.5-12. Fire Protection Effects: Proposed Action

	2000	2005	2015
Forsyth Township	6	12	24
Sands Township	4	8	16
Skandia-West Branch	1	3	6
City of Marquette	0	1	1
Total	11	24	47

Note: Effects of migratory-related population changes on number of sworn officers required are shown cumulatively. Does not include area-generated demands.

Skandia-West Branch Fire Department. Under the Proposed Action, the Skandia-West Branch Fire Department is projected to need one additional fire fighter by 2000 and six by 2015 due to in-migration of 140 and 580 residents, respectively, while maintaining the department's 1992 level-of-service ratio of 10.6 fire fighters per 1,000 persons (see Table 4.5-12). These additional fire fighters would represent an increase of 37.5 percent over the closure staffing level of 16 fire fighters.

Based on the addition of approximately 1 square mile of base property under the jurisdiction of Skandia-West Branch Fire Department and a service ratio of 0.19 fire fighter per square mile of service area, no additional fire fighters are anticipated.

City of Marquette Fire Department. The City of Marquette Fire Department is projected to require no additional fire fighters by 2000 and one by 2015 due to in-migration of 340 and 1,412 residents, respectively, under the Proposed Action (see Table 4.5-12). The closure staffing level of 22 fire fighters would be increased by 4.5 percent to maintain the 1992 level-of-service ratio of 1.0 fire fighter per 1,000 persons in the city.

4.5.4.2 International Wayport Alternative

Forsyth Township Fire Department. Under the International Wayport Alternative, the Forsyth Township Fire Department is projected to require three additional fire fighters by 2000 and nine by 2015 (Table 4.5-13) to maintain the 1992 level of service ratio of 5.8 fire fighters per 1,000 persons due to in-migration of 569 and 1,635 residents. In comparison to the closure staffing level, this alternative would increase the number of fire fighters by 52.9 percent by 2015.

Sands Township Fire Department. The Sands Township Fire Department would require two additional fire fighters by 2000 and six by 2015 due to in-migration of 120 and 345 residents, respectively, under the International Wayport Alternative (see Table 4.5-13). This increase would maintain the 1992 level-of-service ratio of 17.8 fire fighters per 1,000 persons. The

Table 4.5-13. Fire Protection Effects: International Wayport Alternative

	2000	2005	2015
Forsyth Township	3	5	9
Sands Township	2	3	6
Skandia-West Branch	1	1	2
City of Marquette	0	0	1
Total	6	9	18

Note: Effects of migratory-related population changes on number of fire fighters required are shown cumulatively. Does not include area-generated demands.

additional fire fighters by 2015 would increase the closure staffing level by 24.0 percent.

Skandia-West Branch Fire Department. Under the International Wayport Alternative, the Skandia-West Branch Fire Department is projected to need one additional fire fighter by 2000 and two by 2015 due to in-migration of 78 and 225 residents, respectively, while maintaining the department's 1992 level-of-service ratio of 10.6 fire fighters per 1,000 persons (see Table 4.5-13). These additional fire fighters would represent an increase of 12.5 percent over the closure staffing level.

City of Marquette Fire Department. The City of Marquette Fire Department is projected to require no additional fire fighters by 2000 and one by 2015 due to in-migration of 189 and 544 residents, respectively, under the International Wayport Alternative (see Table 4.5-13). The closure staffing level would be increased by 4.5 percent to maintain the 1992 level-of-service ratio of 1.0 fire fighter per 1,000 persons in the city.

4.5.4.3 Commercial Aviation Alternative

Forsyth Township Fire Department. Under the Commercial Aviation Alternative, the Forsyth Township Fire Department is projected to require two additional fire fighters by 2000 and five by 2015 (Table 4.5-14) to maintain the 1992 level-of-service ratio of 5.8 fire fighters per 1,000 persons due to in-migration of 400 and 929 residents, respectively. In comparison to the closure staffing level, this alternative would increase the number of fire fighters by 29.4 percent by 2015.

Sands Township Fire Department. The Sands Township Fire Department would require one additional fire fighter by 2000 and three by 2015 due to in-migration of 84 and 196 residents, respectively, under the Commercial Aviation Alternative (see Table 4.5-14). This increase would maintain the 1992 level-of-service ratio of 17.8 fire fighters per 1,000 persons. The additional fire fighters by 2015 would increase the closure staffing level by 12.0 percent.

Table 4.5-14. Fire Protection Effects: Commercial Aviation Alternative

	2000	2005	2015
Forsyth Township	2	4	5
Sands Township	1	2	3
Skandia-West Branch	1	1	1
City of Marquette	0	0	0
Total	4	7	9

Note: Effects of migratory-related population changes on number of fire fighters required are shown cumulatively. Does not include area-generated demands.

Skandia-West Branch Fire Department. Under the Commercial Aviation Alternative, the Skandia-West Branch Fire Department is projected to need one additional fire fighter by 2000 through 2015 due to projected in-migration of 55 and 128 residents, respectively, while maintaining the department's 1992 level-of-service ratio of 10.6 fire fighters per 1,000 persons (see Table 4.5-14). This additional fire fighter would represent an increase of 6.3 percent over the closure staffing level.

City of Marquette Fire Department. The City of Marquette Fire Department is projected to require no additional fire fighters by 2015 due to in-migration of 134 and 308 residents, respectively, under the Commercial Aviation Alternative (see Table 4.5-14). The closure staffing level would be adequate to maintain the 1992 level-of-service ratio of 1.0 fire fighter per 1,000 persons in the city.

4.5.4.4 Recreation Alternative

Forsyth Township Fire Department. Under the Recreation Alternative, the Forsyth Township Fire Department is projected to require one additional fire fighter by 2000 and two by 2015 to maintain the 1992 level-of-service ratio of 5.8 fire fighters per 1,000 persons (Table 4.5-14). In comparison to the closure staffing level, this alternative would increase the number of fire fighters by 11.8 percent by 2015.

Sands Township Fire Department. Under the Recreation Alternative, the Sands Township Fire Department is projected to need one additional fire fighter from 2000 through 2015 to serve the increased demand while maintaining the department's 1992 level-of-service ratio of 17.8 fire fighters per 1,000 persons (see Table 4.5-15). The additional fire fighter would represent an increase of 4.0-percent over the closure staffing level.

Skandia-West Branch Fire Department. The Skandia-West Branch Fire Department would require no additional fire fighters by 2000 and one by 2015 to meet increased demand for fire protection services under the Recreation Alternative. This increase would maintain the 1992 level-of-service ratio of 10.6 fire fighters per 1,000 persons (see Table 4.5-15). The

Table 4.5-15. Fire Protection Effects: Recreation Alternative

	2000	2005	2015
Forsyth Township	1	1	2
Sands Township	1	1	1
Skandia-West Branch	0	0	1
City of Marquette	0	0	0
Total	2	2	4

Note: Effects of migratory-related population changes on number of fire fighters required are shown cumulatively. Does not include area-generated demands.

one additional fire fighter by 2015 would increase staffing by 6.3 percent over the closure staffing level.

City of Marquette Fire Department. The City of Marquette Fire Department is not projected to require additional fire fighters by 2015 to accommodate increased demand for fire protection services under the Recreation Alternative (see Table 4.5-15). The closure staffing level would be sufficient to maintain the 1992 level-of-service ratio of 1.0 fire fighter per 1,000 persons in the city.

4.5.4.5 No-Action Alternative. Fire protection effects of the No-Action Alternative would be the same as those described in Section 3.5.4 as closure conditions.

4.5.5 Health Care

Following closure, the K. I. Sawyer AFB hospital would be closed, and the Air Force would no longer provide medical services at this site to retired military personnel and their dependents or to dependents of deceased military personnel. The nearest DOD installation is the Great Lakes Naval Station in Chicago, approximately 400 driving miles; therefore, the region's military retirees and their dependents would likely rely on the two acute care hospitals and the various medical personnel in Marquette County for health care services. Veterans residing in the ROI would have access to the VA hospital in Iron Mountain, approximately 100 driving miles, for benefit services. These are the closure conditions to which each of the reuse alternatives are compared.

4.5.5.1 Proposed Action. The base hospital could be reused as a medical clinic within the first 5 years after closure. Through the CHAMPUS program, military retirees and their dependents would have access to the health care services and medical facilities available in the ROI. The ROI health care services at closure would be sufficient to meet the health care needs of retirees and dependents, as well as the in-migrating population.

4.5.5.2 International Wayport Alternative. Implementation of the International Wayport Alternative would have the same health care effects as the Proposed Action.

4.5.5.3 Commercial Aviation Alternative. Implementation of the Commercial Aviation Alternative would have the same health care effects in the ROI as the Proposed Action except that there would be no medical reuse in this alternative.

4.5.5.4 Recreation Alternative. Implementation of the Recreation Alternative would have the same health care effects in the ROI as the Proposed Action except that there would be no medical reuse in this alternative.

4.5.5.5 No-Action Alternative. Health care effects of the No-Action Alternative would be the same as those described in Section 3.5.5 as closure conditions.

4.6 PUBLIC FINANCE

Fiscal effects to potentially affected jurisdictions are presented in this section. The results represent the net effects of reuse after accounting for the out-migration of the direct and indirect military and civilian jobs associated with phasing out the K. I. Sawyer AFB mission.

Assumptions. Conversion of portions of the base to private ownership would directly affect property tax revenues in the jurisdictions within which the portions to be converted to private ownership are located (i.e., Marquette County, Forsyth Township, Sands Township, West Branch Township, and the Gwinn Area Community Schools). Indirect property tax effects may be experienced in other jurisdictions due to the effects on the local tax base of population in-migration over and above the expected population out-migration due to closure.

The disposal and reuse process is explained in Chapter 1 of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan. Key assumptions regarding jurisdictional control of base property under each reuse alternative are presented at the beginning of each of these sections (i.e., the portions of the base that are proposed for private ownership and the portions that are proposed for public ownership) as a public conveyance. Several methods of financing are available for the purchase of property for public ownership including property proposed to be transferred as a public conveyance. One method could be the declaration of the base as a redevelopment area. Purchase and development of improvements could be financed by the issuance of bonds. These bonds would be repaid by the expected incremental increase in taxes on privately

owned property from the expected rise in valuations due to the improvements made by the redevelopment agency in the area.

For purposes of this analysis, financing for the purchase of property and for the development of improvements, as required, is assumed to be direct grants-in-aid from state and federal grant programs, revenue bonds, reserves, and/or other in-place aid programs.

Section 3(e) of P.L. 81-874 provides for supplemental impact aid payments for eligible school districts that have a decrease in the number of students who are dependents of federally connected employees due to a decrease of federal activities within the state. As of September 30, 1994, with the passage of P.L. 103-382 which replaced P.L. 81-874, these Section 3(e) transition funds are no longer available. However, it is proposed under Title 8 of the Elementary and Secondary Education Act of 1994 (P.L. 103-382) that the U.S. Department of Education, using monies provided by DOD, would provide a similar program to replace the loss of Section 3(e) funds.

If a school district receives the supplemental impact aid, federal impact aid that the district would otherwise receive could be supplemented for up to 1 year. Thus, the initial loss of impact aid funds could be reduced and could occur within 2 years after closure. However, an individual school district's supplemental aid is dependent upon the total available federal appropriation, which is determined annually, and the number of districts funded.

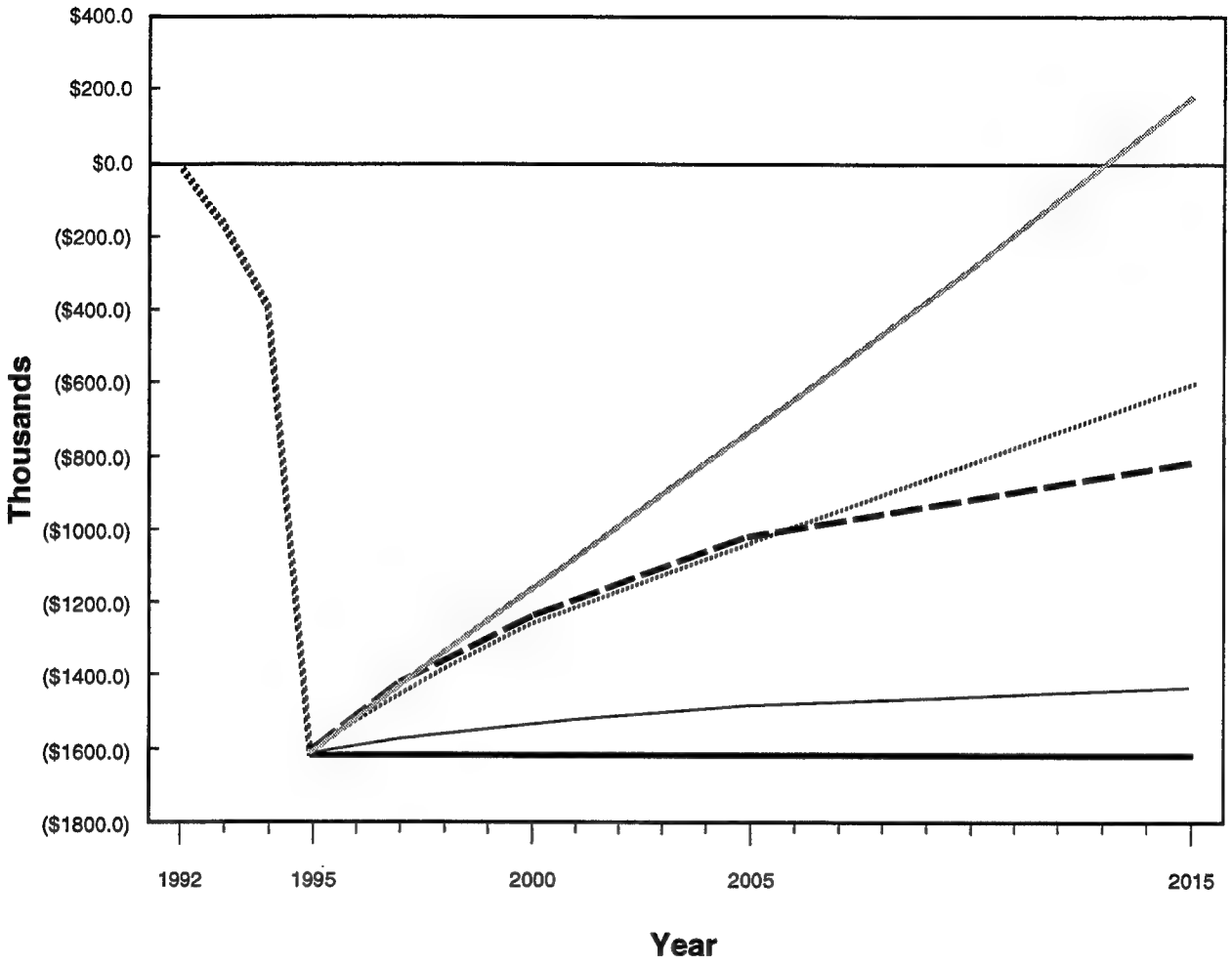
Since passage of the Michigan school financing reforms in March 1994, the state has assumed the responsibility of providing funding for basic education programs at the local level. Minimum funding is guaranteed at $4,200 per pupil and would come from a statewide property tax and increases in sales and other tax and non-tax revenue. It is unclear how these new federal and state laws would affect school districts.

Figures 4.6-1 through 4.6-7 present the net fiscal effects to each jurisdiction for each proposed reuse plan compared to projected fiscal conditions resulting from closure.

4.6.1 Proposed Action

Key assumptions regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below for the Proposed Action:

- The approximately 1,397 acres designated for the airfield and 241 acres designated for aviation support uses would remain in public ownership and would not be subject to local property taxes. The remaining 214 acres in the aviation support land use would be sold to private interests and thus would be subject to local property taxes.

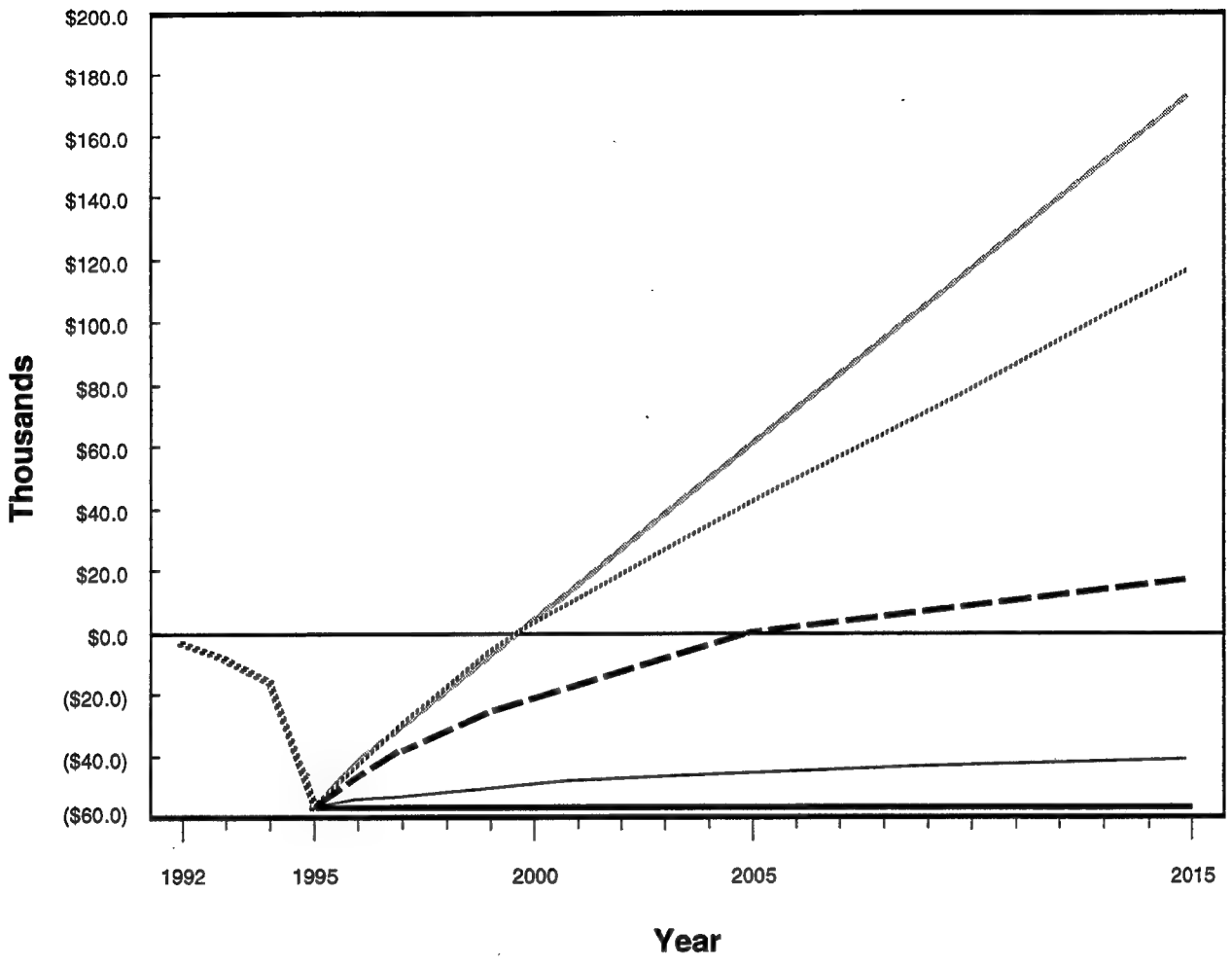


EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

Marquette County Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-1

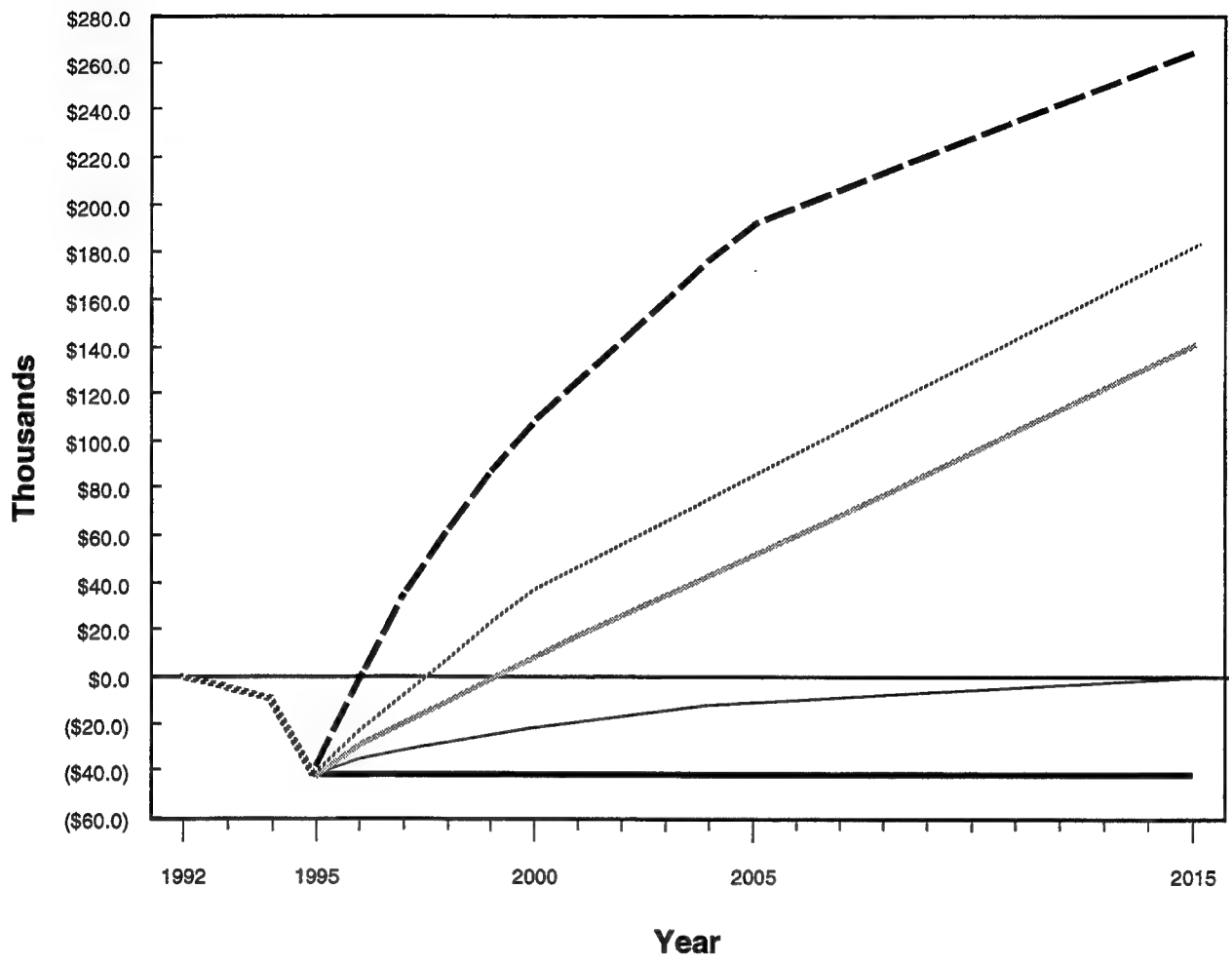


EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

Forsyth Township Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-2

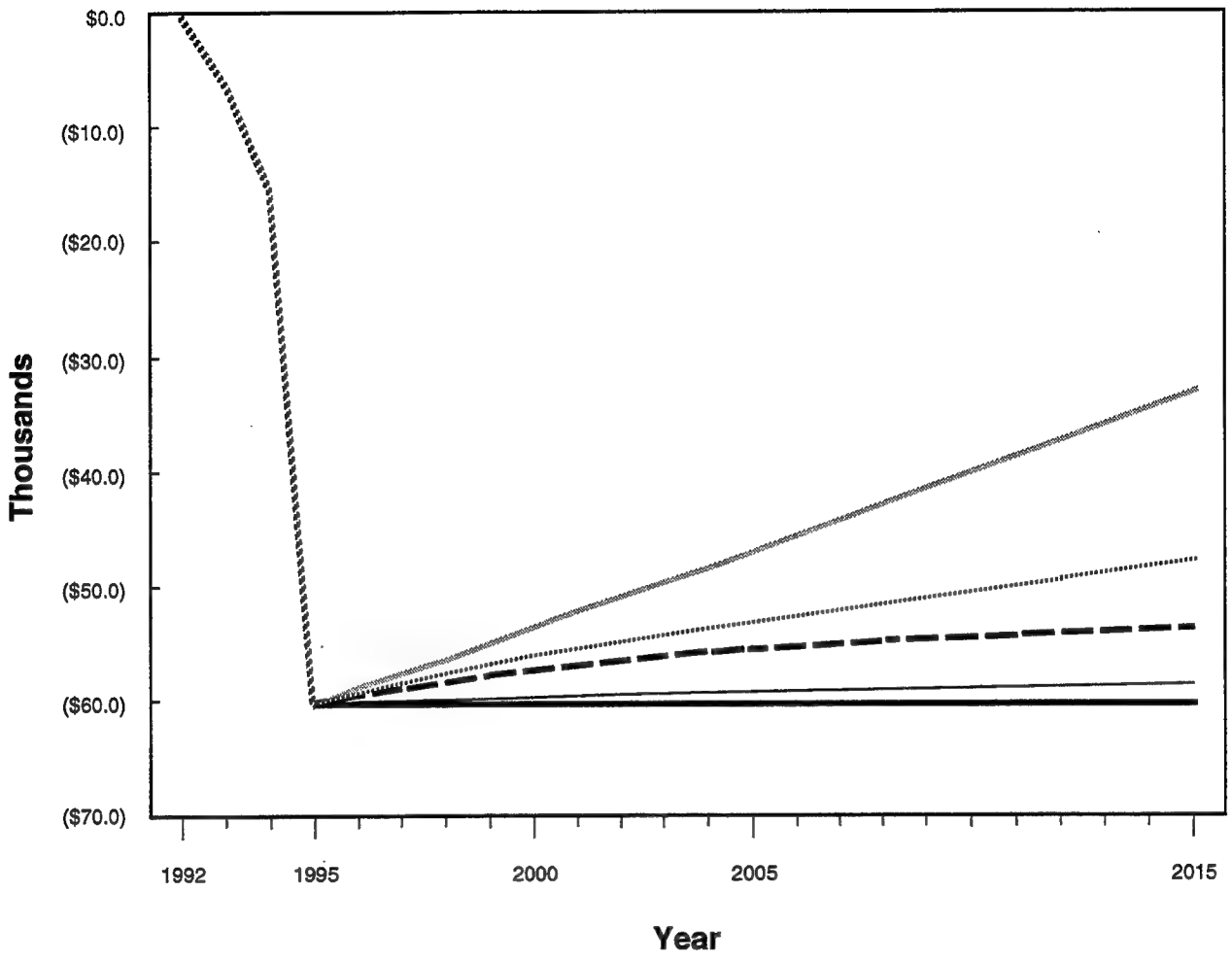


EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

Sands Township Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-3

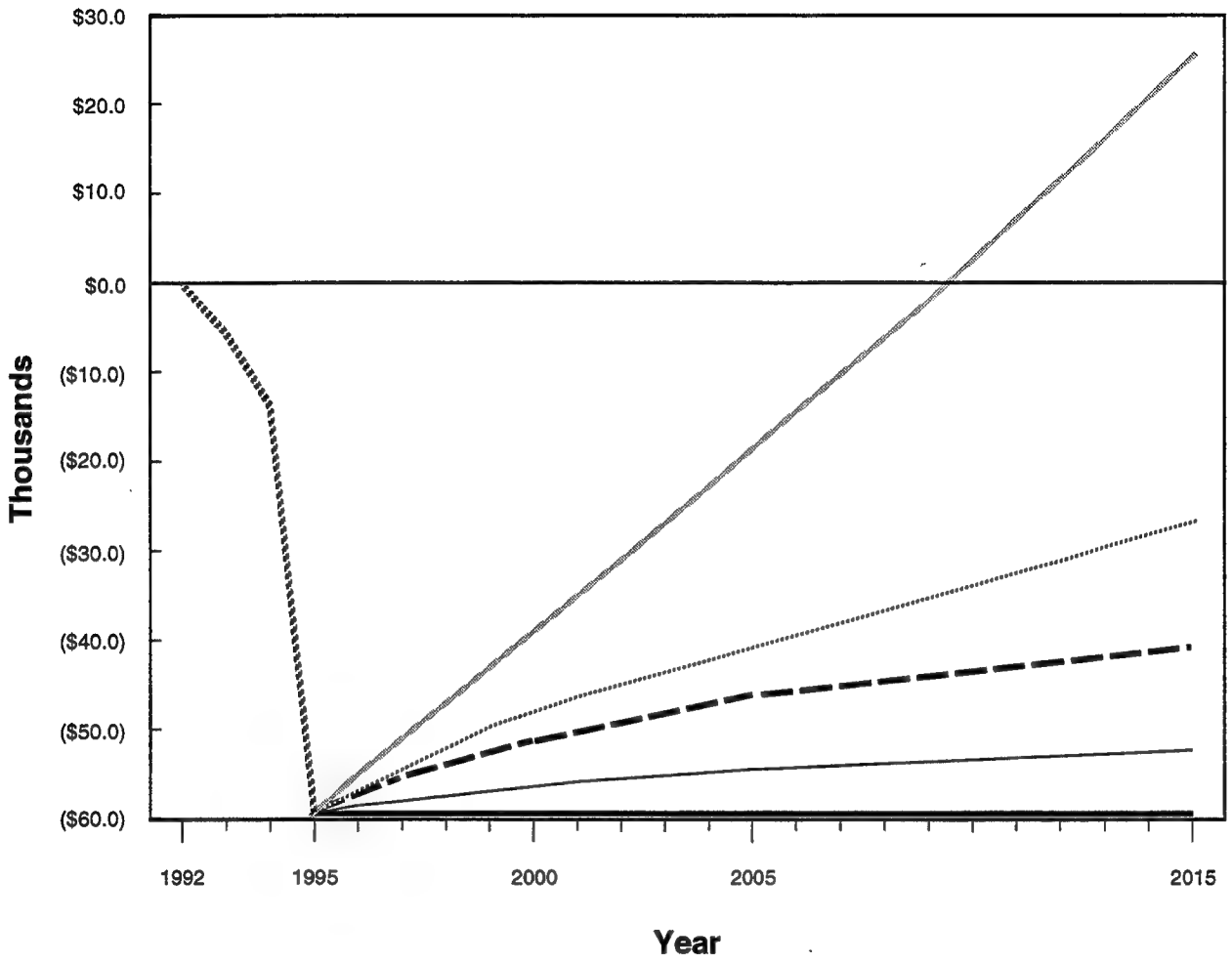


EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

West Branch Township Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-4

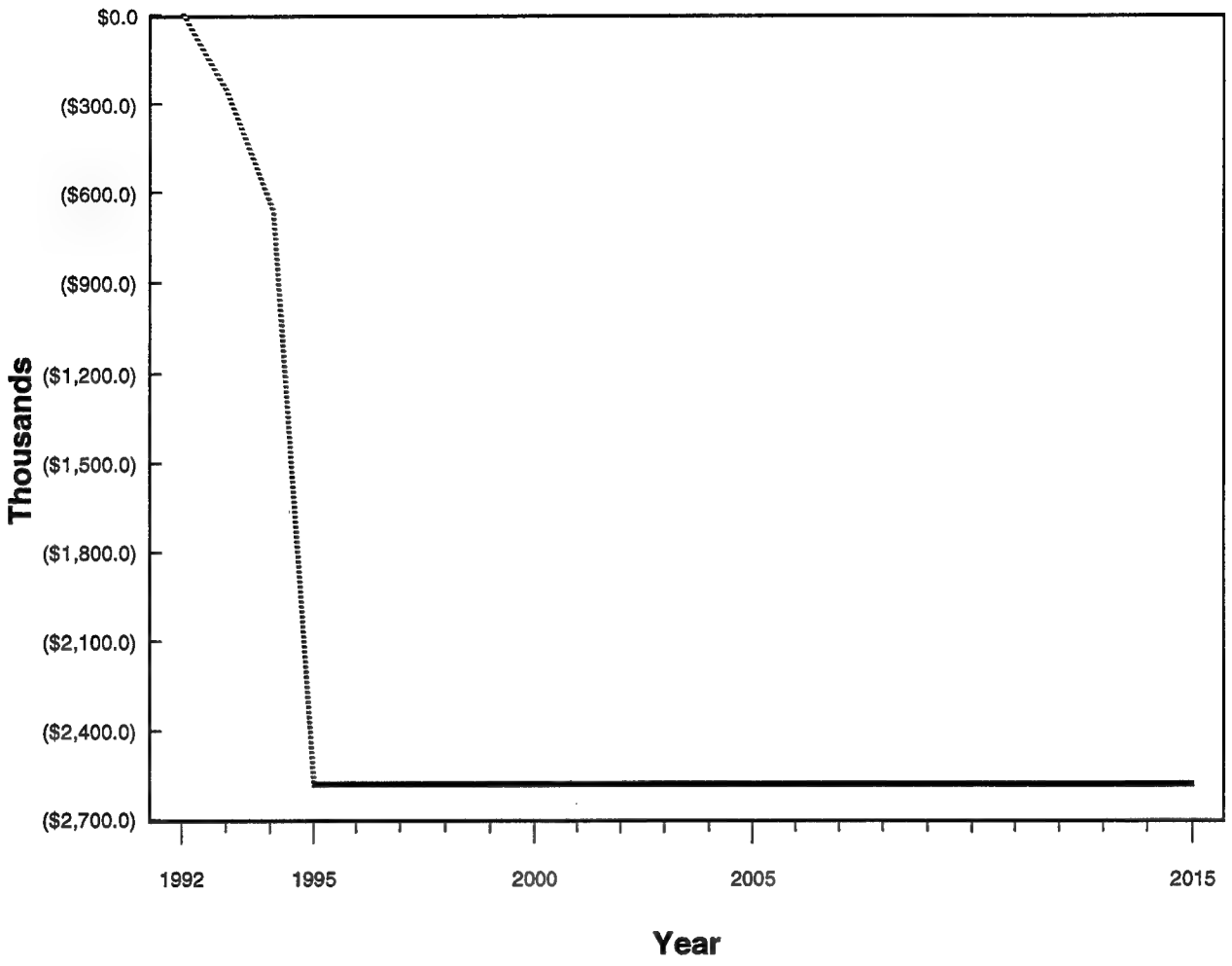


EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

City of Marquette Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-5



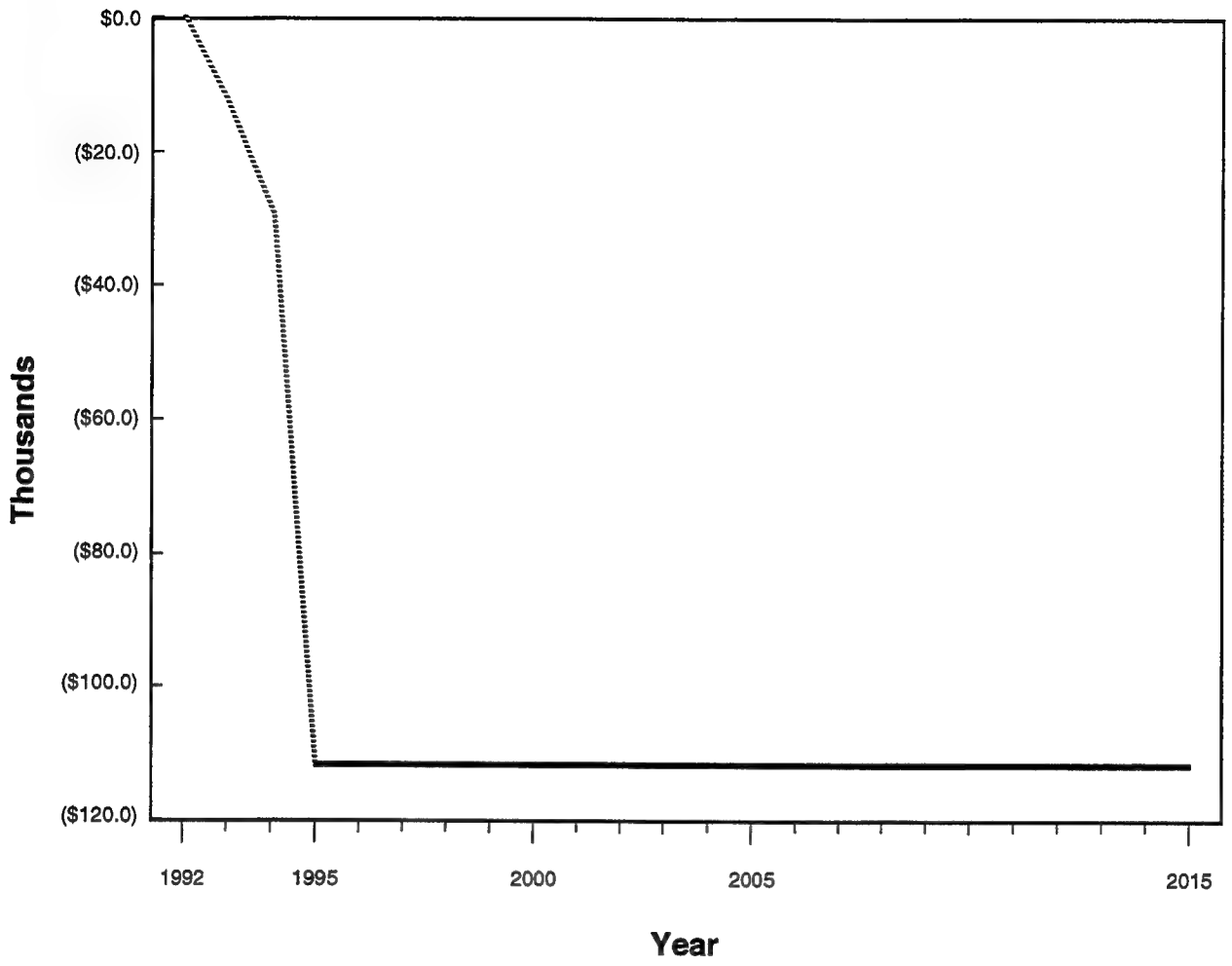
EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

Note: The effects for all alternatives are the same from 1995 to 2015

Gwinn Area Community Schools Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-6



EXPLANATION

- Preclosure
- Proposed Action
- International Wayport Alternative
- Commercial Aviation Alternative
- Recreation Alternative
- No-Action Alternative
- ( ) Negative Values

Note: The effects for all alternatives are the same from 1995 to 2015

Marquette Area Public Schools Net Fiscal Projections, Proposed Action and Alternatives (1992$)

Figure 4.6-7

- The approximately 1,442 acres designated for industrial use and the 41 acres designated for commercial use would be sold to private interests and thus would be subject to local property taxes. The remaining 41 acres in the industrial land use and the 2 acres of the commercial land use would be in public ownership and would not be subject to local property taxes.

- The 24 acres designated for institutional (medical and educational) use are assumed to remain in public ownership and would not be subject to local property taxes.

- The approximately 152 acres designated for residential use would be sold to private interests and thus would be subject to local property taxes.

- The 1,183 acres designated for public facilities/recreation uses and the 186 acres designated for military use would remain in public ownership and would not be subject to local property taxes.

4.6.1.1 Marquette County. Fiscal effects of the Proposed Action on Marquette County indicate an improvement over closure conditions through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come from several sources. Property taxes would increase from conversion of a portion of the base to private use. Intergovernmental revenue and charges for services would increase as direct and secondary jobs attract in-migrating workers to the area. Increased general and special fund revenues are projected to be $860,394 by FY 2000 and $3,504,973 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in county residents are estimated to require $414,463 in increased expenditures by FY 2000 and $1,719,111 by FY 2015. Projected positive net fiscal effects would be $445,931 by FY 2000 and $1,785,862 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $1,604,013 (see Section 3.6) through FY 2013. This deficit would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2014, the positive fiscal effects of this alternative would offset the projected deficit due to base closure.

4.6.1.2 Forsyth Township. Fiscal effects of the Proposed Action on Forsyth Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to general and special revenue funds would be principally from increased property taxes and intergovernmental revenue, and are projected to be $138,209 by FY 2000 and $546,975 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $77,367 in increased expenditures by FY 2000 and $320,837 by FY 2015. Projected net positive fiscal effects would be $60,842 by FY 2000 and $226,138 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $52,587 (see Section 3.6) through FY 1999. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2000, the positive fiscal effects of this alternative would offset the projected deficit due to base closure.

4.6.1.3 Sands Township. Fiscal effects of the Proposed Action on Sands Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to general and special revenue funds would be principally from increased property taxes and intergovernmental revenue and are projected to be $59,716 by FY 2000 and $226,054 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $10,578 in increased expenditures by FY 2000 and $43,844 by FY 2015. Projected positive net fiscal effects would be $49,138 by FY 2000 and $182,210 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $41,165 (see Section 3.6) through FY 1999. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2000, the positive fiscal effects of this alternative would offset the projected deficit due to base closure.

4.6.1.4 West Branch Township. Fiscal effects of the Proposed Action on West Branch Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to general and special revenue funds would be principally from increased property taxes and intergovernmental revenue, and are projected to be $9,087 by FY 2000 and $36,647 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $2,204 in increased expenditures by FY 2000 and $9,132 by FY 2015. Projected positive net fiscal effects would be $6,883 by FY 2000 and $27,515 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $60,220 (see Section 3.6) through FY 2015 ($53,337 by FY 2000 and $32,705 by 2015). This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.1.5 City of Marquette. Fiscal effects of the Proposed Action on the City of Marquette indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would be principally from increased intergovernmental revenue and charges for services, and are projected to be $112,887 by FY 2000 and $468,812 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in city residents are estimated to require $92,499 in increased expenditures by FY 2000 and $384,142 by FY 2015. Projected positive net fiscal effects would be $20,388 by FY 2000 and $84,670 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $59,126 (see Section 3.6) through FY 2009. This deficit would require some response by the city through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2010, the positive fiscal effects of this alternative would offset the projected deficit due to base closure.

4.6.1.6 Gwinn Area Community Schools. Based on a projected additional 1,154 students in the Gwinn Area Community Schools by 2015, increased revenues and expenditures of the district would be $4,846,800.

With no projected net revenue increases, the projected closure deficit of $2,565,245 (see Section 3.6) would remain through 2015. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in

Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.1.7 Marquette Area Public Schools. Based on a projected additional 247 students in the Marquette Area Public Schools by 2015, increased revenues and expenditures of the district would be $1,037,400.

The projected closure deficit of $111,264 (see Section 3.6) would remain through FY 2015 since there are no projected net revenue increases. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.2 International Wayport Alternative

Key assumptions regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below for the International Wayport Alternative:

- The approximately 1,055 acres designated for the airfield and 241 acres designated for aviation support would remain in public ownership and would not be subject to local property taxes. The remaining 376 acres in the aviation support land use would be sold to private interests and thus would be subject to local property taxes.

- The approximately 454 acres designated for industrial use, the 64 acres designated for commercial use, and the 538 acres designated for residential use would be sold to private interests and thus would be subject to local property taxes. The remaining 41 acres in the industrial land use would be in public ownership and would not be subject to local property taxes.

- The 138 acres designated for institutional (educational) use are assumed to remain in public ownership and would not be subject to local property taxes. The 24 acres designated for institutional (medical) use are assumed to be sold to private interests and thus would be subject to local property taxes.

- The 1,118 acres designated for public facilities/recreation uses would remain in public ownership and would not be subject to local property taxes.

- The 874 acres designated for agricultural use would be sold to private interests and thus would be subject to local property taxes.

4.6.2.1 Marquette County. Fiscal effects of this alternative on Marquette County indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come from several sources. Property taxes would increase from conversion of a portion of the base to private use. Intergovernmental revenue and charges for services would increase as direct and secondary jobs attract in-migrating workers to the area. Increased general and special fund revenues are projected to be $580,943 by FY 2000 and $1,669,568 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in county residents are estimated to require $231,809 in increased expenditures by FY 2000 and $666,195 by FY 2015. Projected positive net fiscal effects would be $349,134 by FY 2000 and $1,003,373 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $1,604,013 (see Section 3.6) through FY 2015 ($1,254,879 by FY 2000 and $600,640 by FY 2015). This deficit would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.2.2 Forsyth Township. Fiscal effects of this alternative on Forsyth Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would be principally from increased property taxes and intergovernmental revenue, and are projected to be $102,962 by FY 2000 and $295,880 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $43,414 in increased expenditures by FY 2000 and $124,749 by FY 2015. Projected net positive fiscal effects would be $59,548 by FY 2000 and $171,131 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $52,587 (see Section 3.6) through FY 1999. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2000, the positive fiscal effects of this alternative would offset the projected deficit due to closure.

4.6.2.3 Sands Township. Fiscal effects of the Proposed Action on Sands Township indicate an improvement over the post-closure scenario through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would be principally from increased property taxes and intergovernmental revenue, and are projected to be $83,661 by FY 2000 and $240,442 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $5,932 in increased expenditures by FY 2000 and $17,053 by FY 2015. Projected positive net fiscal effects would be $77,729 by FY 2000 and $223,389 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $41,165 (see Section 3.6) through FY 1997. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 1998, the positive fiscal effects of this alternative would offset the projected deficit due to closure.

4.6.2.4 West Branch Township. Fiscal effects of this alternative on West Branch Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would be principally from increased property taxes and intergovernmental revenue, and are projected to be $5,602 by FY 2000 and $16,142 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $1,228 in increased expenditures by FY 2000 and $3,543 by FY 2015. Projected positive net fiscal effects would be $4,374 by FY 2000 and $12,599 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $60,220 (see Section 3.6) through FY 2015. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.2.5 City of Marquette. Fiscal effects of this alternative on the City of Marquette indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would be principally from increased intergovernmental revenue and charges for services, and are projected to be $62,752 by FY 2000 and $180,619 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in city residents are estimated to require $51,418 in increased expenditures by FY 2000 and $147,998 by FY 2015. Projected positive net fiscal effects would be $11,334 by FY 2000 and $32,621 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $59,126 (see Section 3.6) through FY 2015. This deficit would require some response by the city through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.2.6 Gwinn Area Community Schools. Based on a projected additional 449 students in the Gwinn Area Community Schools by 2015, increased revenues and expenditures of the district would be $1,885,800.

With no projected net revenue increases, the projected closure deficit of $2,565,245 (see Section 3.6) would remain through FY 2015. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.2.7 Marquette Area Public Schools. Based on a projected additional 95 students in the Marquette Area Public Schools by 2015, increased revenues and expenditures of the district would be $399,000.

The projected closure deficit of $111,264 (see Section 3.6) would remain through FY 2015 since there are no projected net revenue increases. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.3 Commercial Aviation Alternative

Key assumptions regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below for the Commercial Aviation Alternative:

- The approximately 510 acres designated for the airfield and 168 acres designated for aviation support uses would remain in public ownership and would not be subject to local property taxes. The remaining 157 acres in the aviation support land use would be sold to private interests and thus would be subject to local property taxes.

- The approximately 453 acres designated for industrial use and the 25 acres designated for commercial use would be sold to private interests and thus would be subject to local property taxes. The remaining 41 acres in the industrial land use area would be in public ownership and would not be subject to local property taxes.

- The 546 acres designated for institutional (educational) use are assumed to remain in public ownership and would not be subject to local property taxes.

- The approximately 147 acres designated for residential use would be sold to private interests and thus would be subject to local property taxes.

- The 1,387 acres designated for public facilities/recreation uses would remain in public ownership and would not be subject to local property taxes.

- The approximately 1,489 acres designated for agricultural use would be sold to private interests and thus would be subject to local property taxes.

4.6.3.1 Marquette County. Fiscal effects of this alternative on Marquette County indicate an improvement over the post-closure scenario through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come from several sources. Property taxes would increase from conversion of a portion of the base to private use. Intergovernmental revenue and charges for services would increase as direct and secondary jobs attract in-migrants to the area. Increased general and special fund revenues are projected to be $531,411 by FY 2000 and $1,166,657 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in county residents are estimated to require $163,290 in increased expenditures by FY 2000 and $378,156 by FY 2015. Projected positive net fiscal effects would be $368,121 by FY 2000 and $788,501 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $1,604,013

(see Section 3.6) through FY 2015 ($1,235,892 by 2000 and $815,512 by 2015). This deficit would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.3.2 Forsyth Township. Fiscal effects of this alternative on Forsyth Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $65,842 by FY 2000 and $144,297 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $30,520 in increased expenditures by FY 2000 and $70,882 by FY 2015. Projected positive net fiscal effects would be $35,322 by FY 2000 and $73,415 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $52,587 (see Section 3.6) through FY 2004. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources. By FY 2005, the positive fiscal effects of this alternative would offset the projected deficit due to closure.

4.6.3.3 Sands Township. Fiscal effects of this alternative on Sands Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $152,508 by FY 2000 and $314,759 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $4,152 in increased expenditures by FY 2000 and $9,688 by FY 2015. Projected positive net fiscal effects would be $148,356 in FY 2000 and $305,071 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $41,165 (see Section 3.6) through FY 1996. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

By FY 1997, the positive fiscal effects of this alternative would offset the projected deficit due to closure.

4.6.3.4 West Branch Township. Fiscal effects of this alternative on West Branch Township indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $3,917 by FY 2000 and $8,803 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $866 in increased expenditures by FY 2000 and $2,015 by FY 2015. Projected positive net fiscal effects would be $3,051 by FY 2000 and $6,788 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $60,220 (see Section 3.6) through FY 2015. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.3.5 City of Marquette. Fiscal effects of this alternative on the city of Marquette indicate an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased intergovernmental revenue and charges for services, and are projected to be $44,491 by FY 2000 and $102,262 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in city residents are estimated to require $36,455 in increased expenditures by FY 2000 and $83,793 by FY 2015. Projected positive net fiscal effects would be $8,036 by FY 2000 and $18,469 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $59,126 (see Section 3.6) through FY 2015. This deficit would require some response by the city through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.3.6 Gwinn Area Community Schools. Based on a projected additional 255 students in the Gwinn Area Community Schools by 2015, increased revenues and expenditures of the district would be $1,071,000.

With no projected net revenue increases, the projected closure deficit of $2,565,245 (see Section 3.6) would remain through 2015. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.3.7 Marquette Area Public Schools. Based on a projected additional 54 students in the Marquette Area Public Schools by 2015, increased revenues and expenditures of the district would be $226,800.

The projected closure deficit of $111,264 (see Section 3.6) would remain through FY 2015, since there are no projected net revenue increases. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.4 Recreation Alternative

Key assumptions regarding future jurisdictional control of base property, which influence the fiscal assessments, are presented below for the Recreation Alternative:

- The approximately 756 acres designated for industrial use, the 67 acres designated for institutional (educational) use, the 13 acres designated for commercial use, and the 60 acres designated for residential use would be sold to private interests and thus would be subject to local property taxes. The remaining 41 acres in the industrial land use would be in public ownership and would not be subject to local property taxes.

- The 3,986 acres designated for public facilities/recreation use would remain in public ownership and would not be subject to local property taxes.

4.6.4.1 Marquette County. Fiscal effects of this alternative on Marquette County indicate there would be an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come from several sources. Property taxes would increase from conversion of a portion of the base to private use. Intergovernmental revenue and charges for services would increase as direct and secondary jobs attract in-migrating workers to the area. Increased general and special

fund revenues are projected to be $133,817 by FY 2000 and $318,005 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in county residents are estimated to require $57,906 in increased expenditures by FY 2000 and $142,251 by FY 2015. Projected positive net fiscal effects would be $75,911 by FY 2000 and $175,754 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $1,604,013 (see Section 3.6) through FY 2015. This deficit would require some response by the county through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.4.2 Forsyth Township. Fiscal effects of this alternative on Forsyth Township indicate there would be an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $17,945 by FY 2000 and $41,980 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $10,987 in increased expenditures by FY 2000 and $26,857 by FY 2015. Projected positive net fiscal effects would be $6,958 by FY 2000 and $15,123 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $52,787 (see Section 3.6) through FY 2015. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.4.3 Sands Township. Fiscal effects of this alternative on Sands Township indicate there would be an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $20,632 by FY 2000 and $44,445 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $1,483 in increased expenditures by FY 2000 and $3,658 by FY 2015. Projected positive net fiscal effects would be $19,149 by FY 2000 and $40,787 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $41,165 (see Section 3.6) through FY 2015. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.4.4 West Branch Township. Fiscal effects of this alternative on West Branch Township indicate there would be an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased property taxes and intergovernmental revenue, and are projected to be $1,013 by FY 2000 and $2,430 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in township residents are estimated to require $315 in increased expenditures by FY 2000 and $756 by FY 2015. Projected positive net fiscal effects would be $698 by FY 2000 and $1,674 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $60,220 (see Section 3.6) through FY 2015. This deficit would require some response by the township through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.4.5 City of Marquette. Fiscal effects of this alternative on the city of Marquette indicate there would be an improvement over the closure baseline through FY 2015.

Revenues. Increased revenues to the general and special revenue funds would come principally from increased intergovernmental revenue and charges for services, and are projected to be $15,605 by FY 2000 and $38,182 by FY 2015.

Expenditures and Net Fiscal Effects. Service demands as a result of the increase in city residents are estimated to require $12,787 in increased expenditures by FY 2000 and $31,286 by FY 2015. Projected positive net fiscal effects would be $2,818 by FY 2000 and $6,896 by FY 2015.

Comparison to Closure Conditions. The net revenue increases, however, would not be sufficient to offset the projected closure deficit of $59,126 (see Section 3.6) through FY 2015. This deficit would require some response by the city through service cutbacks, increases in tax and non-tax revenue schedules, and/or development of new revenue sources.

4.6.4.6 Gwinn Area Community Schools. Based on the projection of 96 additional students in the Gwinn Area Community Schools by 2015, increased revenues and expenditures of the district would be $403,200.

The projected closure deficit of $2,565,245 (see Section 3.6) would remain through FY 2015 since there are no projected net revenue increases. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.4.7 Marquette Area Public Schools. Based on the projection of 20 additional students in the Marquette Area Public Schools by 2015, increased revenues and expenditures of the district would be $84,000.

With no projected net revenue increases, the projected closure deficit of $111,264 (see Section 3.6) would remain through FY 2015. The school district financing legislation passed in March 1994 provides funding such that revenues equal expenditures. With the new legislation, it is uncertain how prior deficits would be offset. The closure conditions described in Chapter 3 and referenced above assume no receipt of supplemental impact aid.

4.6.5 No-Action Alternative

Public finance effects of the No-Action Alternative would be the same as those described in Section 3.6.2 as closure conditions.

4.7 TRANSPORTATION

The effects of each alternative on the components of the transportation system (including roadways, air transportation, and other transportation modes) are presented in this section. A more detailed discussion is presented in Section 4.2.3 of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan.

Reuse-related effects on roadway traffic were assessed by estimating the number of trips generated by each alternative, based on travel patterns for commuters and on the locations of residences of base personnel as obtained from zip code data. It is assumed that the residential choices of the reuse-related employees would correspond to those of base personnel. Future baseline traffic was projected to grow by 1.0 percent per year, according to the Marquette County Highway Department. Traffic effects were determined based on LOS changes for the key roads. As part of the eventual site development plan, internal circulation must accommodate reuse-related vehicular traffic and pedestrian activities, and provide an

acceptable LOS and adequate access from the local road network. Redevelopment plans are expected to incorporate internal circulation requirements that meet local planning objectives and standards.

Because none of the alternatives assumes direct use of the local railroads, direct effects on these systems are expected to be minimal.

4.7.1 Proposed Action

Roadways. Traffic generated on the roads within the ROI as a result of the Proposed Action land uses and direct employment is estimated to be 33,950 daily vehicle trips by 2015. Major land uses generating effects include industrial, commercial, and residential.

By 2015, the traffic resulting from reuse on U.S. 41 between SH 28 and SH 94 would not degrade the operating conditions compared to the No-Action Alternative.

Under the Proposed Action, the traffic generated by reuse on SH 35 from CR 553 to CR 456 through Gwinn would degrade the operating conditions to LOS D, compared to LOS A under the No-Action Alternative. All other key regional road segments would continue to operate at LOS B or better.

By 2015, traffic resulting from reuse on the segments of CR 553 between CR 480 and Southgate Drive would degrade the operating conditions to LOS F by 2015, compared to LOS C under the No-Action Alternative. The section of CR 553 from Southgate Drive to SH 35 would degrade to LOS D, compared to LOS B under the No-Action Alternative. CR 553 from the Marquette city limits to CR 480 would degrade to LOS E by 2015, compared to LOS C under the No-Action Alternative.

The afternoon peak-hour traffic generated as a result of reuse on CR 480, west of CR 553, would degrade the operating conditions to LOS D by 2015, compared to LOS B under the No-Action Alternative.

By 2015, the traffic volume on CR 462, the main entrance to the base from CR 553 on the west, would degrade to LOS E. Under the Proposed Action, CR 460 from Gate 2 (east base entrance) to CR 545 would operate at LOS D by 2015, compared to LOS A under the No-Action Alternative. The proposed access points from CR 553 to the new air carrier terminal and industrial areas on the west side of the base would operate at LOS C or better.

With or without reuse, all other key local road segments would operate at LOS C or better throughout the period of analysis.

Air Transportation. Implementation of the Proposed Action would result in a new industrial and economic base in the region, which in turn would spur new growth in air travel demand. The use of K. I. Sawyer AFB as a regional airport could have a minor effect on travelers residing in the southernmost and northernmost parts of the ROI. The location of K. I. Sawyer AFB with respect to competing facilities may draw passengers from the southern edge of the ROI that use Delta County Airport (Escanaba) or Iron Mountain Airport. Conversely, residents in the northwest edge of the ROI, especially those in Baraga County that use Marquette County Airport, could find Hancock/Houghton Regional Airport more convenient. Because this effect is based on driving distance and the facilities in the ROI provide similar air service, the associated impacts would offset each other and K. I. Sawyer AFB would not experience any measurable gain or loss in enplanements. The use of K. I. Sawyer AFB instead of Marquette County Airport would not affect general aviation operations in the ROI because the proposed airport is capable of accommodating all types of general aviation aircraft. Since there is no air cargo service at Marquette County Airport, the proposed air cargo would provide this service to the ROI under the Proposed Action.

4.7.2 International Wayport Alternative

Roadways. Traffic generated on the roads within the ROI as a result of the International Wayport Alternative land uses and direct employment is estimated to be 30,400 daily vehicle trips by 2015. Major land uses affecting the roadways would include aviation support, industrial, commercial, and residential uses.

The operating conditions on U.S. 41 between SH 28 and SH 94 would not degrade as a result of reuse as compared to the No-Action Alternative. On SH 35 from CR 553 to CR 456 through Gwinn, traffic generated by reuse would increase and reduce operating conditions to LOS C, compared to LOS A under the No-Action Alternative. All other key regional road segments would continue to operate at LOS B or better.

Local traffic generated by reuse on CR 462, the main base access, would degrade the operating conditions to LOS F by 2015, compared to LOS A under the No-Action Alternative. Segments of CR 553 between CR 480 and Southgate Drive would also decline to LOS E by 2015, compared to LOS C under the No-Action Alternative. The section of CR 553 from the Marquette city limits to CR 480 would degrade to LOS D by 2015, compared to LOS C under the No-Action Alternative. Another segment of CR 553, from Southgate Drive to SH 35, will degrade to LOS C, compared to LOS B under the No-Action Alternative. Conditions on CR 480 west of CR 553 would also decline to LOS C by 2015, compared to LOS B under the No-Action Alternative. The access point from CR 553 to the new air carrier terminal would operate at LOS B. All other key local road segments would operate at LOS C or better throughout the period of analysis.

Air Transportation. Implementation of the International Wayport Alterative would result in a new industrial and economic base in the region, which in turn would spur new growth in air travel demand. With the closure of Marquette County Airport and the relocation of aircraft activity to K. I. Sawyer AFB, no changes in regional air transportation for the ROI are expected in the short term. Because of K. I. Sawyer AFB's location relative to other airports in the Upper Peninsula, it is anticipated that K. I. Sawyer AFB would continue to draw traffic from the same population base as Marquette County Airport. However, increased use of the airport under the international wayport concept could provide for more direct flights to domestic non-stop destinations, which may in turn draw passengers from other regional airports such as Escanaba or Iron Mountain. The facilities at the new airport proposed under this alternative would be able to accommodate this increased demand in commercial service and would provide international air cargo service to the ROI. The Marquette County Airport does not currently provide air cargo service.

4.7.3 Commercial Aviation Alternative

Roadways. Traffic generated on the roads within the ROI as a result of the Commercial Aviation Alternative land uses and direct employment is estimated to be 20,700 daily vehicle trips by 2015. Major land uses affecting the roadways would include institutional (educational) and aviation reuses.

Traffic resulting from reuse on U.S. 41 between SH 28 and SH 94 would not degrade the operating conditions on this segment. SH 35 between CR 553 and CR 456 would degrade to LOS C by 2015, compared to LOS A under the No-Action Alternative. All other key regional road segments would continue to operate at LOS B or better.

On CR 462, the main base access, traffic would degrade operating conditions to LOS E, compared to LOS A under the No-Action Alternative. Reuse-related traffic on CR 480 west of CR 553 results in LOS C by 2015, compared to LOS B under the No-Action Alternative.

Under the Commercial Aviation Alternative, traffic generated by reuse on CR 553 between the Marquette city limits and Southgate Drive would degrade the operating conditions on CR 480 to the Southgate Drive segment of CR 553 to LOS E by 2015, compared to LOS C under the No-Action Alternative. The Marquette city limits to the CR 480 segment of CR 553 would operate at LOS D by 2015, compared to LOS C under the No-Action Alternative.

With or without reuse, all other key local road segments would operate at LOS C or better throughout the period of analysis.

Air Transportation. The Commercial Aviation Alternative assumes the closure of Marquette County Airport and the transfer of operations to K. I. Sawyer AFB. Effects on air transportation would be the same as those discussed for the Proposed Action, except no air cargo service would be provided under the Commercial Aviation Alternative.

4.7.4 Recreation Alternative

Roadways. Traffic generated on the roads within the ROI as a result of the Recreation Alternative land uses and direct employment is estimated to be 6,200 daily vehicle trips by 2015. Major land uses would include residential and public facilities/recreation.

The operating conditions on U.S. 41 through Skandia would be at LOS D, and SH 28 to SH 94 would be at LOS C by 2015, with or without reuse-related activities. All other key regional road segments would continue to operate at LOS B or better.

Under this alternative, the segment of CR 480 west of CR 553 would operate at LOS C by 2015, compared to LOS B under the No-Action Alternative. The segment of CR 553 from Southgate Drive to the city of Marquette would operate at LOS C by 2015, with or without reuse. All other key local road segments would operate at LOS B or better throughout the period of analysis.

Air Transportation. There would be no effects to the region's air transportation under the Recreation Alternative.

4.7.5 No-Action Alternative

Transportation effects of the No-Action Alternative would be the same as those conditions described in Section 3.7. With limited operations at K. I. Sawyer AFB and with the base in caretaker status, transportation demands in Marquette County and the communities surrounding the base would decline slightly as the base population drops. However, continued long-term growth in the region would lead to increased traffic on regional and major local roads.

In the absence of any reuse of the base under the No-Action Alternative, on-base roads would no longer be used except by the OL.

4.8 UTILITIES

This study characterizes the type of utility use and subsequent infrastructure changes that would be required under each reuse alternative. The specific on-base infrastructure improvements needed and the associated costs with such improvements would be borne directly or indirectly by the future site

developer(s). The city of Marquette plans to expand potable water facilities by 1998. A more detailed discussion of the reuse alternatives is provided in Section 4.2.4 of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan.

Potable water, wastewater, and solid waste demands are not anticipated to exceed capacity of the utility systems, and interruption of electric and gas service is not anticipated under any alternative.

4.8.1 Proposed Action

A summary of utility consumption changes associated with the Proposed Action is shown in Table 4.8-1. The increased utility demand for water, wastewater, solid waste, electricity, and natural gas would be 122.58, 50.95, 24.53, 17.90, and 22.64 percent, respectively, by 2015 over the No-Action Alternative.

4.8.2 International Wayport Alternative

A summary of utility consumption changes associated with the International Wayport Alternative is shown in Table 4.8-1. Under this alternative, the increased utility demand for water, wastewater, solid waste, electricity, and natural gas would be 47.74, 33.60, 16.68, 13.42, and 14.19 percent, respectively, by 2015 over the No-Action Alternative.

4.8.3 Commercial Aviation Alternative

A summary of utility consumption changes associated with the Commercial Aviation Alternative is shown in Table 4.8-1. The increased utility demand for water, wastewater, solid waste, electricity, and natural gas would be 33.55, 23.31, 10.78, 9.21, and 10.50 percent, respectively, by 2015 over the No-Action Alternative.

4.8.4 Recreation Alternative

A summary of utility consumption changes associated with the Recreation Alternative is shown in Table 4.8-1. Utility use through 2015 for water, wastewater, solid waste, and electricity would increase by 8.71, 5.69, 3.18, and 2.23 percent, respectively, over the No-Action Alternative. Natural gas consumption is projected to increase by 10.59 percent as a result of the conversion of the base central heating plant to a gas-fired power plant.

4.8.5 No-Action Alternative

Utility uses for the No-Action Alternative would be the same as those described in Section 3.8 as closure conditions.

Table 4.8-1. Projected Reuse-Related Average Daily Utility Use in the ROI

	2000			2005			2015		
	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase
Water Consumption (MGD)									
No-Action Alternative[a]	2.84			2.93			3.10		
Proposed Action	3.80	0.96	33.80	4.81	1.88	64.16	6.89	3.79	122.25
International Wayport Alternative	3.56	0.72	25.35	3.93	1.00	34.13	4.58	1.48	47.77
Commercial Aviation Alternative	3.19	0.35	12.32	3.57	0.64	21.84	4.14	1.04	33.55
Recreation Alternative	2.94	0.10	3.52	3.10	0.17	5.80	3.37	0.27	8.71
Wastewater Treatment (MGD)									
No-Action Alternative[a]	3.39			3.49			3.69		
Proposed Action	3.86	0.47	13.86	4.41	0.92	26.36	5.57	1.88	50.95
International Wayport Alternative	3.99	0.60	17.70	4.33	0.84	24.07	4.93	1.24	33.60
Commercial Aviation Alternative	3.67	0.28	8.26	4.00	0.51	14.61	4.55	0.86	23.31
Recreation Alternative	3.46	0.07	2.06	3.62	0.13	3.72	3.90	0.21	5.69
Solid Waste Disposal (tons/day)									
No-Action Alternative[a]	164.60			169.20			179.70		
Proposed Action	176.16	11.56	7.02	191.24	22.04	13.03	223.78	44.08	24.53
International Wayport Alternative	178.70	14.10	8.57	189.14	19.94	11.78	209.67	29.97	16.68
Commercial Aviation Alternative	171.29	6.69	4.06	181.03	11.83	6.99	199.08	19.38	10.78
Recreation Alternative	166.45	1.85	1.12	172.66	3.46	2.04	185.41	5.71	3.18
Electrical Consumption (MWH/day)									
No-Action Alternative[a]	987.06			1,038.13			1,146.10		
Proposed Action	1,042.12	55.06	5.58	1,142.03	103.90	10.01	1,351.26	205.16	17.90
International Wayport Alternative	1,066.47	79.41	8.05	1,145.85	107.72	10.38	1,299.94	153.84	13.42
Commercial Aviation Alternative	1,023.10	36.04	3.65	1,102.64	64.51	6.21	1,251.71	105.61	9.21
Recreation Alternative	995.05	7.99	0.81	1,053.75	15.62	1.50	1,171.69	25.59	2.23
Natural Gas Consumption (MMCF/day)									
No-Action Alternative[a]	9.40			9.70			10.29		
Proposed Action	10.00	0.60	6.38	10.86	1.16	11.96	12.62	2.33	22.64
International Wayport Alternative	10.12	0.72	7.66	10.69	0.99	10.21	11.75	1.46	14.19
Commercial Aviation Alternative	9.79	0.39	4.15	10.38	0.68	7.01	11.37	1.08	10.50
Recreation Alternative	10.28	0.88	9.36	10.68	0.98	10.10	11.38	1.09	10.59

Note: (a) Represents total average daily use in the ROI for the year indicated based on projections by local utility purveyors.
MGD = million gallons per day
MMCF = million cubic feet
MWH = megawatt-hours
ROI = Region of Influence

4.9 OTHER LAND USE CONCEPTS

This study includes an in-depth analysis only for those reuse options that, as a whole, provide an integrated plan for future site redevelopment. The other land use concepts, the MANG, the correctional facility, the sawmill, the waste to energy/recycling facility and the waste to energy/environmental support operations described in Section 1.4.6 could occur on an individual basis or in combination with one of the reuse alternatives (except with the Proposed Action, which includes the MANG and would, therefore, selectively enhance or detract from site redevelopment. A descriptive treatment of the potential effects is presented in this section and summarized in Table 4.9-1.

Michigan Army National Guard. The 107th Combat Engineering Battalion of the Upper Peninsula has requested 202 acres for a headquarters and weekend drills. Direct employment is estimated at 50 FTE personnel. This represents a net increase of 13 direct employees with the International Wayport Alternative and 43 employees with the Recreation Alternative, and a decrease of 59 employees with the Commercial Aviation Alternative.

Correctional Institution. The correctional institution concept includes 273 acres for development of a maximum security correctional facility. This represents a net reduction of 1,600 direct employees under the Proposed Action and an increase of 250 employees under each of the other alternatives.

Sawmill. The sawmill concept would include approximately 142 acres, for use as a sawmill including a dry kiln and planing mill. Direct employment is estimated at 90 personnel. This represents a net decrease of 120 direct employees with the Proposed Action, and a net increase of 28 employees with the International Wayport Alternative, 72 employees with the Commercial Aviation Alternative, and 89 employees with the Recreation Alternative.

Waste to Energy/Recycling. This concept includes the use of Buildings 417 and 735, and the base heating plant for use as a recycling center and waste energy facility utilizing municipal solid waste as a full source. Direct employment is estimated at 50 FTE personnel. This represents a net decrease of approximately 80 jobs in conjunction with the Proposed Action and Alternatives.

Waste to Energy/Environmental Support Operations. This land use concept would involve the reuse of the Education Center (Building 540), Heating Plant, Hobby Shop (Building 824), Base Exchange (Building 643), and the service station (Building 826). Direct employment is estimated at 100 personnel. This represents a net decrease of 49 direct employees with the Proposed Action, 184 with the International Wayport Alternative, 84 with

Table 4.9-1. Socioeconomic Effects of Other Land Use Concepts
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Agency/Proposal	Employment/ Population	Alternative	Change in Reuse Plan
Michigan Army National Guard	50 direct jobs	International Wayport Alternative	Reduced aviation support development (by 104 acres) Reduced agricultural use (by 98 acres) Net increase of 13 direct jobs
		Commercial Aviation Alternative	Reduced industrial use (by 98 acres) Reduced institutional use (by 4 acres) Reduced agricultural land (by 100 acres) Net decrease of 59 direct jobs
		Recreation Alternative	Reduced industrial development (by 102 acres) Reduced public facilities/recreation land (by 100 acres) Net increase of 43 direct jobs
Correctional Institution	250 direct jobs	Proposed Action	Reduced industrial development (by 273 acres) Net decrease of 1,600 direct jobs
		International Wayport Alternative and Commercial Aviation Alternative	Reduced agricultural land (by 273 acres) Net increase of 250 direct jobs
		Recreation Alternative	Reduced public facilities/recreation land (by 273 acres) Net increase of 250 direct jobs

Table 4.9-1. Socioeconomic Effects of Other Land Use Concepts
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Agency/Proposal	Employment/ Population	Alternative	Change in Reuse Plan
Sawmill	90 direct jobs	Proposed Action	Reduced aviation support land use (by 12 acres) Reduced industrial development (by 12 acres) Reduced public facilities/recreation land (by 9 acres) Net decrease of 120 direct jobs
		International Wayport Alternative	Reduced industrial use (by 110 acres) Reduced aviation support use (by 20 acres) Reduced public facilities/recreation use by 12 acres) Net increase of 28 direct jobs
		Commercial Aviation Alternative	Reduced industrial development (by 102 acres) Reduced aviation support land (by 20 acres) Reduced public facilities/recreation land (by 20 acres) Net increase of 72 direct jobs
		Recreation Alternative	Reduced industrial development (by 20 acres)

Table 4.9-1. Socioeconomic Effects of Other Land Use Concepts
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Agency/Proposal	Employment/ Population	Alternative	Change in Reuse Plan
Waste to Energy/Recycling			Reduced public facilities/recreation land (by 122 acres) Net increase of 89 direct jobs
	50 direct jobs	Proposed Action	Reduced industrial development (by 15 acres) Net decrease of 84 direct jobs
		International Wayport Alternative	Reduced aviation support land (by 1 acre) Reduced industrial development (by 14 acres) Net decrease of 85 direct jobs
		Commercial Aviation Alternative	Reduced industrial development (by 14 acres) Reduced agriculture use (by 1 acre) Net decrease of 84 direct jobs
		Recreation Alternative	Reduced industrial development (by 14 acres) Reduced public facilities/recreation use (by 1 acre) Net decrease of 79 direct jobs
Waste to Energy/Environmental Support Operations	100 direct jobs	Proposed Action	Reduced industrial development (by 14 acres) Reduced commercial use (by 1 acre) Reduced public facilities/recreation use (by 3 acres) Net decrease of 49 direct jobs
		International Wayport Alternative	Reduced industrial use (by 14 acres) Reduced commercial use (by 4 acres) Net decrease of 184 direct jobs
		Commercial Aviation Alternative	Reduced industrial development (by 14 acres) Reduced commercial land (by 2 acres) Reduced institutional use (by 2 acres) Net decrease of 84 direct jobs
		Recreation Alternative	Reduced industrial development (by 14 acres) Reduced commercial use (by 2 acres) Reduced institutional use (by 2 acres) Net decrease of 131 direct jobs

the Commercial Aviation Alternative, and 131 with the Recreation Alternative.

4.10 SUMMARY OF SOCIOECONOMIC EFFECTS OF RELOCATING AIRCRAFT OPERATIONS FROM MARQUETTE COUNTY AIRPORT TO K.I. SAWYER AFB

The Proposed Action, International Wayport Alternative, and Commercial Aviation Alternative assume relocation of aircraft operations from Marquette County Airport to K. I. Sawyer AFB. With K. I. Sawyer AFB serving as a regional airport, the Marquette area would not need a second airport at the existing Marquette County Airport site.

The impacts of relocating aircraft operations from Marquette County Airport are not described in detail in this SIAS. No definite plans for the closure and reuse of Marquette County Airport have been developed by the K. I. Sawyer Base Conversion Authority or any other local agency. Therefore, it is assumed that the airport would remain in caretaker status until a final decision by the local community and the FAA is made concerning the future reuse of Marquette County Airport. The impacts of relocating aircraft operations based at Marquette County Airport are outlined below. Impacts are described for the same resource categories as discussed in this SIAS for the Proposed Action, International Wayport Alternative, and Commercial Aviation Alternative.

Economic Activity. Employment associated with the reuse activities generated by industrial, institutional (education and government), commercial, public facilities/recreation, and residential development at Marquette County Airport is anticipated to create approximately 400 new jobs in the county. While most of the new jobs would be filled by workers residing within the ROI, it is possible that some of the newly created jobs would be filled by workers relocating into the ROI.

Population. Some of the employment opportunities created by the reuse of Marquette County Airport would be filled by workers and their dependents relocating to the ROI, creating population in-migration.

Housing. Total new seasonal housing demand was projected to average 0.5 percent per year in the ROI. Population in-migration associated with the reuse of Marquette County Airport is not anticipated to create migratory-related housing demand in the ROI.

Public Services. Population in-migration associated with the reuse of Marquette County Airport is not anticipated to create changes in the level of public services in any of the affected jurisdictions.

Public Finance. The reuse of Marquette County Airport for residential, commercial, industrial, and other uses could affect property tax revenues in Marquette County and Negaunee Township.

Property tax effects are determined based upon the portions of the airport that may be converted to private use. Indirect effects to other jurisdictions may be experienced depending upon the population in-migration.

Transportation. Reuse activities from Marquette County Airport property could increase traffic on U.S. 41 to levels similar to those when the airport was operational if the site is completely developed over 20 years. If reuse of the airport includes residential development, LOS on U.S. 41 could degrade from the current LOS C. The LOS D on SH 35 at the intersection with U.S. 41 should not be affected by reuse of the airport. Traffic on other local roads surrounding the airport may also increase depending on the traffic circulation required for the development of the airport property.

The reuse of Marquette County Airport as a non-aviation-related facility will not impact regional air transportation or airspace.

Utilities. Direct changes in future utility use at the site were based on historic per capita use at the Marquette County Airport and within Marquette County. The reuse activities could increase the water demand at the site to 0.07 MGD, wastewater generation to 0.06 MGD, electrical use to 14 MWH, solid waste generation to 3.2 tons, and natural gas consumption to 0.47 MMCF. However, all of the local utility purveyors have sufficient design capacities (see Sections 3.2.4 and 3.5) to meet the needs of reuse development at this site.

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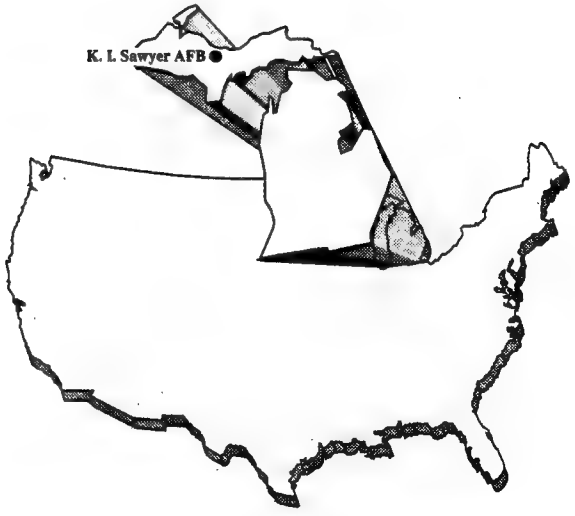


CHAPTER 5
CONSULTATION AND COORDINATION

5.0 CONSULTATION AND COORDINATION

The federal, state, and local agencies and private agencies/organizations that were contacted during the course of preparing this SIAS are listed below.

FEDERAL AGENCIES

U.S. Army Reserve
U.S. Department of Commerce, Bureau of the Census
U.S. Department of Commerce, Bureau of Economic Analysis
U.S. Department of Commerce, Bureau of Occupational and Professional Regulation
U.S. Department of Education

STATE AGENCIES

Michigan Army National Guard
Michigan Department of Education
Michigan Department of Management and Budget
Michigan Department of Public Health
Michigan Department of Transportation
Michigan Employment Security Commission
Michigan State Police
Northern Michigan University

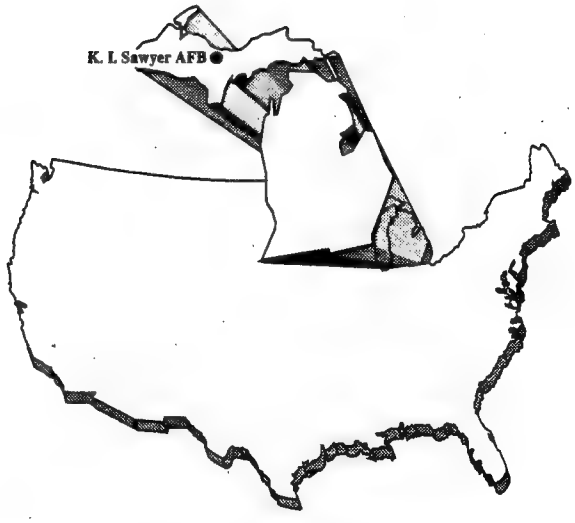
LOCAL/REGIONAL AGENCIES

Central Upper Peninsula Planning and Development
Chocolay Township
Delta County
Forsyth Township
Forsyth Township Maintenance Department
Gwinn Area Community Schools
Ishpeming, City of
Ishpeming Police Department
Ishpeming Public Schools
Ishpeming Township
Marquette, City of
Marquette Area Public Schools
Marquette Board of Light and Power
Marquette Police and Fire Departments
Marquette City Water and Sewer Department
Marquette County
Marquette County Highway Department
Marquette County Sheriff's Department
Marquette County Solid Waste Management Authority
Marquette Township
Negaunee, City of

Negaunee Public Schools
Negaunee Township
Sands Township
West Branch Township

PRIVATE ORGANIZATIONS

Bell Memorial Hospital
Chicago and Northwestern Railroad
Marquette Chamber of Commerce
Marquette General Hospital
Michigan Consolidated Gas Company
Michigan Gas Company
NPA Data Services, Inc.
St. Francis Hospital
Upper Peninsula Power Company



CHAPTER 6
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6.0 LIST OF PREPARERS AND CONTRIBUTORS

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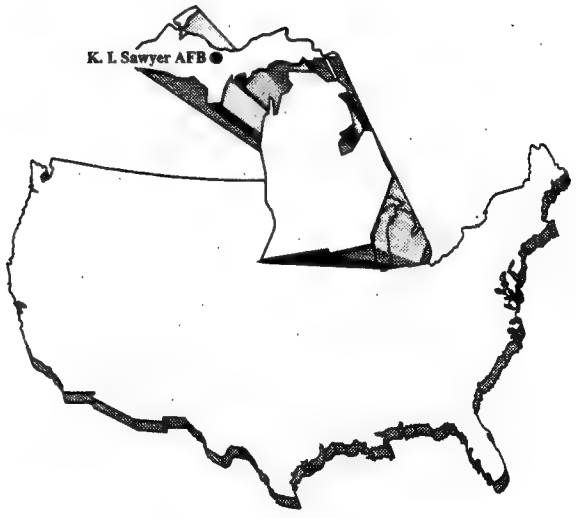

CHAPTER 7
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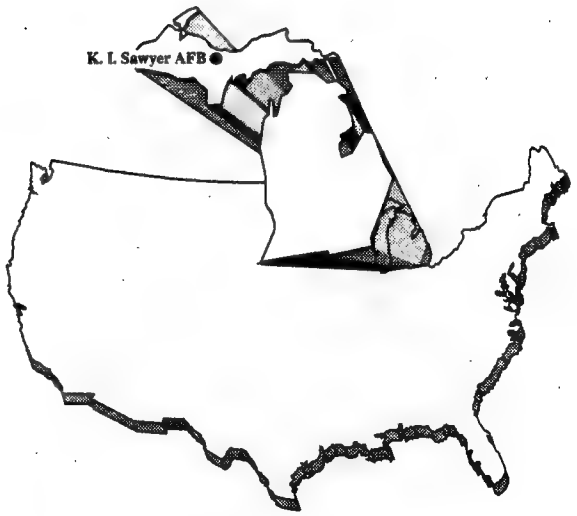
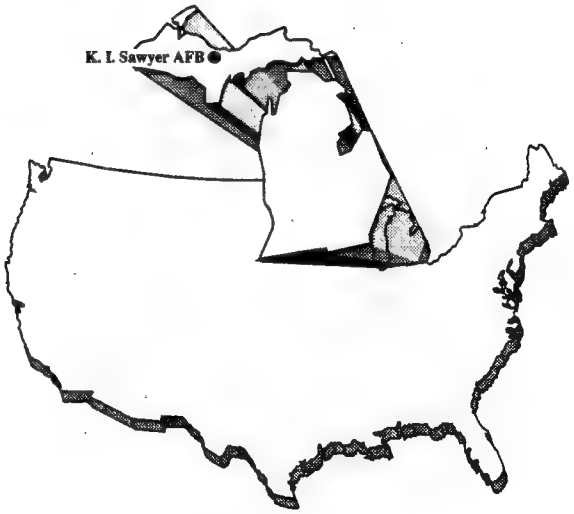


APPENDICES



APPENDIX A

APPENDIX A
DATA SOURCES

Economic Activity

County-level jobs and earnings data, provided by major industrial sector and personal income data, were obtained for 1969 through 1990 from the Regional Economic Information System (U.S. Bureau of Economic Analysis, 1993a). Indices for the conversion of current-year dollars to constant 1992 dollars were provided in the Economic Report of the President prepared by the U.S. Council of Economic Advisors (1993). Data pertaining to the labor force and employed and unemployed workers in Marquette and Delta counties were obtained from the Michigan Employment Security Commission (1993). Information concerning the largest employers in the area near K. I. Sawyer Air Force Base (AFB) was obtained from the Marquette Area Chamber of Commerce (1993). Data concerning K. I. Sawyer AFB personnel, payrolls, and spending within the region were obtained from K. I. Sawyer AFB Economic Resource Impact Statements (U.S. Air Force, 1988, 1989, 1990, 1991, 1992a). Regional output, earnings, and jobs multipliers were obtained from the Regional Input-Output Multiplier System (RIMS II) for the two-county Region of Influence (ROI) consisting of Marquette and Delta counties (U.S. Bureau of Economic Analysis, 1993b).

Population

The primary source of population data for this study was the U.S. Bureau of the Census. The data examined included the 1990 Census of Population and Housing for the United States (U.S. Bureau of the Census, 1991b). Supplemental population data were obtained from the 1980 Census of Population (U.S. Bureau of the Census, 1982c), which, when compared with the 1990 data, provided the change experienced in the ROI during the last decade. Population projections prepared by NPA Data Services, Inc. (1993) provided data on anticipated population changes in the two-county ROI over the next two decades. Air Force personnel data by zip code for both military and civilian personnel at K. I. Sawyer AFB were used to determine the distribution of employees within the ROI (U.S. Air Force, 1992b, 1993b).

Housing

The major source on housing characteristics in the ROI is the 1990 Census of Population and Housing (U.S. Bureau of the Census, 1991b). Additional housing data were obtained from the 1980 Census of Housing (U.S. Bureau of the Census, 1982b). An examination of the census data provided a comparison of change over time for several key housing characteristics.

Data in the Current Construction Report Series provided information on housing units authorized by building permits, thereby indicating the capacity of the construction industry to provide housing within selected parts of the ROI (U.S. Bureau of the Census, 1981, 1982a, 1983, 1984, 1985, 1986, 1987b, 1988, 1989, 1990, 1991a, 1992, 1993).

Public Services

Information regarding staffing levels, jurisdictional boundaries, degrees of use, equipment, and facilities for public service providers was acquired directly through personal communication with agency representatives (Bahrman, 1993; Bjorne, 1993; Ferguson, 1993; Forsyth Township Police Department, 1993; Huber, 1993; Hytinen, 1993; Iman, 1993; Johnson, 1994; Kippola, 1993; Maino, 1994; Nemacheck, 1993; Roberts, 1994; Van Oosterhout, 1994; Yelle, 1993). Additional information regarding public education was obtained from the Michigan Department of Education (McAuliffe, 1994), Gwinn Area Community Schools (Yeadon, 1993, 1994) and the Marquette Area Public Schools (Baldini, 1993; Bergin, 1993). This included enrollment data for local school districts. Information on security and fire protection provided by the federal government within the boundaries of K. I. Sawyer AFB was acquired from representatives of the base.

Public Finance

Data sources for public finance included the most recent financial reports, typically from FY 1991 through FY 1993, and the current year budget reports for the potentially affected local government units in the ROI (Anderson, Tackman, & Company, 1993; City of Marquette, 1990, 1991, 1992; Davis, 1991, 1992, 1993; Steven M. Foulks, CPA, 1991, 1992, 1993; Kroncich & Associates, 1991a, 1992a, 1993a; Marquette Area Public Schools, 1993). The financial reports provided the actual amount of revenue collected and money spent compared to budgeted levels during the covered period. Budget reports were used as sources of property tax rate and assessed valuation information.

Transportation

Data regarding road and highway transportation including maps, circulation plans, highway improvement plans, and traffic volume counts were obtained from the Michigan Department of Transportation (Hitchens, 1993), the Marquette County Highway Department (Morissette, 1993), and the Michigan State Police (Dawson, 1993). Information regarding rail transportation was obtained from the Chicago and Northwestern railroad (Choquette, 1993). Information concerning maritime activity was provided by the Marquette harbormaster.

Utilities

Base utilities data including historic consumption, peak demand characteristics, storage and distribution capacities, and related information were obtained from the base civil engineering office and the base water and wastewater facility operators. Public and private utility suppliers and related local agencies were also contacted to obtain historic consumption data, peak demand characteristics, storage and distribution capacities, and related information, including projections of future utility demands for the particular service areas of each utility provider.

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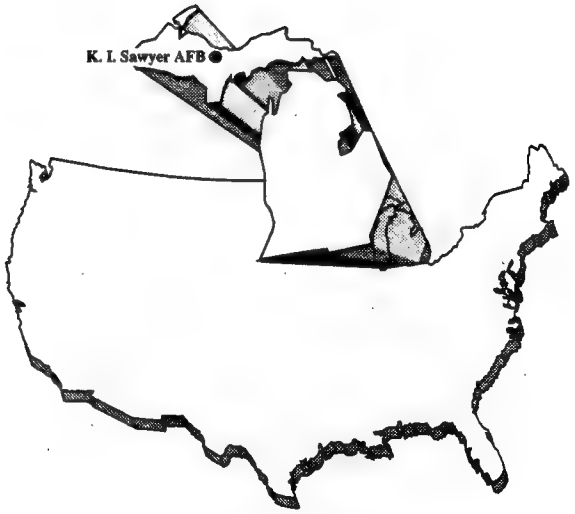


APPENDIX B

APPENDIX B
METHODS

This appendix presents the methods used to evaluate preclosure and future socioeconomic conditions, for both post-closure without interim leases or long-term reuse (No-Action Alternative) and for the reuse alternatives. The description of preclosure socioeconomic conditions includes important indicators that provide a basis for comparison to national trends, as well as to future conditions with and without the alternatives.

All changes associated with the Proposed Action, the International Wayport Alternative, the Commercial Aviation Alternative, and the Recreation Alternative were considered effects. The No-Action Alternative was considered equivalent to closure baseline conditions. Under these baseline conditions, the Operating Location (OL) would be retained by the federal government for an indefinite period of time. The Proposed Action and alternatives are compared to these baseline conditions without reuse to analyze their effects.

Historic data were used to define preclosure conditions and recent trends, as well as to develop projections of future socioeconomic conditions that would result from base closure without reuse. Chapter 3 identifies any potential beneficial or limiting factors within the region. Chapter 4 determines whether such factors might make the region either more or less susceptible to negative socioeconomic effects as a result of the alternatives.

Region of Influence

Definition of the Region of Influence (ROI) occurred in two steps. First, in support of the Base Closure and Realignment Commission in 1992, an ROI was defined for each of the 88 Air Force bases being evaluated for the potential socioeconomic effects of closure. Starting with the host county, the ROI was extended to other adjacent counties, taking into consideration such factors as the proximity of principal communities in the surrounding area and the transportation network, until about 90 percent of the residences of base personnel were considered to have been included. Second, this initial ROI was refined as data gathered for the Socioeconomic Impact Analysis Study (SIAS) gave a clearer picture of the area around the base.

The factor of primary importance in refining the ROI used in this analysis was the distribution of residences for military personnel stationed at K. I. Sawyer Air Force Base (AFB) and civilian personnel working at the base in November 1993. This residential distribution has a critical influence on where the greatest effects of closure occur. It also provides a useful guide

to the possible effects of reusing the base since it reflects availability of suitable housing, commuting patterns, and attractiveness of area communities for people employed on the site. The distribution of both civilian and military personnel served to quantify the effects of closure. However, only the distribution of civilian personnel was used to estimate the future distribution of direct worker residences because it provided a more probable allocation of in-migrating worker residential patterns.

Table B-1 displays the residential distribution by county, city or town, and zip code for all personnel employed at the base for which data were available. Counties and sub-county areas were used to present and analyze this information because they provided a comprehensive and mutually exclusive coverage of the entire geographic area. Data on the zip codes of residences of base personnel were obtained from the base comptroller's office. This sample of base personnel is likely to be a highly reliable guide to the residential distribution of the total base population. These zip codes were mapped to cities, townships, and counties (Figure B-1) to derive the information presented in Table B-1. Most base personnel lived within the boundaries of the townships of Forsyth, Sands, and West Branch.

Due to these interactions, most of the regional socioeconomic effects associated with closure and reuse of K. I. Sawyer AFB would occur within Marquette and Delta counties.

This information was used to determine the percentages of out-migrating workers during the closure process and to allocate in-migrating workers to communities associated with site development.

The second factor in determining the extent of the socioeconomic effects of both closure and reuse of K. I. Sawyer AFB within the region depends on the degree of interindustry economic linkages among the economies of the communities in the region. These linkages, based on the trade among regional sectors, determine the nature and magnitude of the multiplier effect of actions at the base. K. I. Sawyer AFB is located within a region that has a less diverse economy than more urbanized parts of the nation (see Chapter 3). The base's influence on the ROI economy is therefore relatively great.

Region of Influence

Economic Activity

Most demands associated with regional economic effects of base closure and potential reuse activities at the site were anticipated to be concentrated within Marquette and Delta counties.

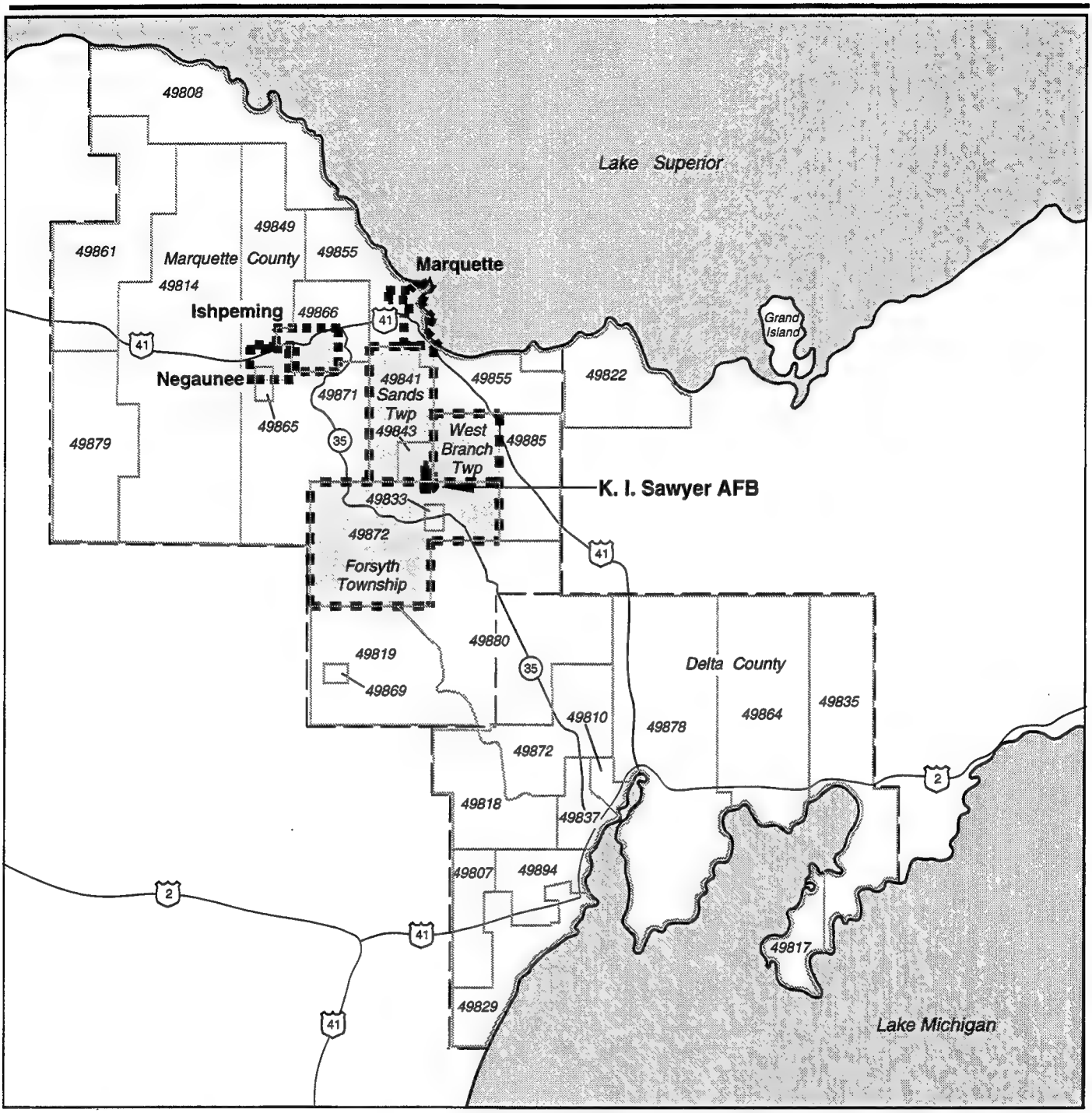
Table B-1. Residential Locations of K.I. Sawyer AFB Military and Civilian Personnel, by City, Zip Codes, and County

County and Sub-county	Zip Codes	Military Personnel	Civilian Personnel	Total Personnel	Percent of Total
Marquette County		2,881	437	3,318	97.2
Forsyth Township	49833 and parts of 49841 and 49843	1,706	205	1,911	56.0
Sands Township	Parts of 49841 and 49843	405	43	448	13.1
West Branch Township	Parts of 49885 and 49843	568	28	596	17.5
City of Ishpeming	Part of 49849	9	15	24	0.7
City of Marquette	Part of 49855	112	64	176	5.1
City of Negaunee	Part of 49866	10	23	33	1.0
Remainder of Marquette County	49808, 49814, 49819, 49822, 49861, 49869, 49871, 49879, and parts of 49849, 49855, 49866 and 49885	71	59	130	3.8
Delta County	49807, 49829, 49837, 49878, and 49880	5	52	57	1.7
ROI Total		2,886	489	3,375	98.9
Outside of ROI	49806, 49816, 49817, 49822, 49825, 49826, 49831, 49862, 49890, 49891, and 49908	11	25	36	1.1
Total		2,897	514	3,411	100.0

Note: Data shown are for personnel for which zip code of residence was available from base personnel offices. Data for civilian personnel are for appropriated and nonappropriated fund personnel. Allocations to town and city portions of zip codes were based on 1990 U.S. Census population.

Sources: Mapping to county, township, and city areas prepared for this study was based on Rand McNally & Company, 1988; U.S. Air Force, 1993b.

Secondary or multiplier effects within the ROI, which are determined by the extent of economic interactions and linkages within the region, would be lower than more populated and more economically diverse parts of the



EXPLANATION

- (35) State Highway
- (41) U.S. Highway
- County Boundary
- Jurisdictional Boundaries (Township and City)
- Zip Code Boundary

0 3.5 7 14 Miles

Zip Code Boundaries, Townships, Cities and Counties in Vicinity of K. I. Sawyer AFB

Figure B-1

nation. Although this indicates that there would likely be additional economic effects outside the ROI because of the linkage of industries in the ROI with those outside, the interaction with industries outside the ROI would be so dispersed that the effects in other regions of Michigan and of the United States would be minimal.

Population

The population effects of closure and potential reuse of K. I. Sawyer AFB were analyzed at both regional and local levels, and the ROI consists of Marquette and Delta counties. Population effects were further allocated based upon the likely residency patterns of personnel associated with each reuse alternative and the communities most affected by base closure. These included Forsyth, Sands, and West Branch townships and the cities of Ishpeming, Marquette, and Negaunee.

In 1993, 93.4 percent of K. I. Sawyer AFB military and civilian personnel resided in these communities. The remaining personnel were widely scattered among other communities and represented very small portions of the populations in those areas.

Housing

Housing effects resulting from closure and reuse of K. I. Sawyer AFB were analyzed at both regional and local levels. Housing effects were expected to follow the distribution of population effects, as discussed above. As with population, housing effects were expected to be greatest in the communities closest to the base. Thus the ROI is the same for housing issues as it is for population issues: Marquette and Delta counties; Forsyth, Sands, and West Branch townships; and the cities of Ishpeming, Marquette, and Negaunee.

Public Services

The public service analysis focused on the principal jurisdictions likely to be most affected by base closure and reuse, including those that provide services directly to K. I. Sawyer AFB military and civilian personnel or their dependents and those that have public service and facility arrangements with the base. These jurisdictions include the Marquette County government; Forsyth, Sands, and West Branch township governments; the Marquette city government; and the Gwinn Area Community Schools and Marquette Area Public Schools districts. Also included in the analysis were component police departments, including the units of Forsyth Township and the city of Marquette; fire protection agencies including the units of Forsyth, Sands, and Skandia-West Branch; the city of Marquette; and the Michigan State Police and Marquette County Sheriff's departments, responsible for providing services to unincorporated areas or under contract to incorporated

area residents. Health care providers and facilities within the ROI are discussed qualitatively.

Public Finance

The public finance analysis addressed the fiscal implications of public service changes caused by base closure and reuse. The public finance ROI consequently includes the jurisdictions comprising the public services ROI: the Marquette County government; Forsyth, Sands, and West Branch township governments; the Marquette city government; and the Gwinn Area Community Schools and Marquette Area Public Schools districts.

Transportation

The ROI for transportation analysis includes primarily Forsyth Township and the city of Marquette with emphasis on the immediate area surrounding K. I. Sawyer AFB. Within this geographic area, the analysis covers the principal road, air, waterway, and rail transportation networks including those segments that serve as direct or indirect linkages to the base, those that would be affected during reuse, and those used by K. I. Sawyer AFB personnel.

Utilities

The ROI for assessing utility systems is made up of the service areas of each utility purveyor servicing communities most affected by the closure and reuse of K. I. Sawyer AFB. The ROI includes the city of Marquette and Forsyth Township.

Methods

Economic Activity

The economic activity analysis concentrated first on estimating ROI effects on employment and worker out-migration and in-migration, and then on allocating these effects to areas (counties and communities) within the ROI.

Analysis of economic effects utilized total output, employment, and earnings multipliers for the ROI obtained from the U.S. Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II). Interindustry multipliers were prepared by the BEA using the United States input-output table in combination with the most recently available region-specific information describing the relationship of the regional economy to the national economy. The BEA's RIMS II model is based on research by Cartwright et al. (1981).

The same basic methodology was used to develop quantitative projections of economic activity for closure conditions and the reuse alternatives. Changes in regional demand in each local industrial and household sector were first estimated as follows:

- For preclosure and closure conditions, demands from caretaker activities were estimated from employment, payroll, and contract data published in Economic Resource Impact Statements for K. I. Sawyer AFB.

- For reuse, construction-phase demands were estimated from cost data published by R.S. Means Company, Inc. (1991a, 1991b), and from factors developed in support of the Description of Proposed Action and Alternatives (DOPAA). Operations-phase demands were estimated from land use job planning factors and regional output per job estimates derived from RIMS II coefficients.

These primary or direct effects were then multiplied, using RIMS II multipliers specific to the regional economy, resulting in estimated direct and secondary output, employment, and earnings associated with the alternatives. Due to the lack of payroll data for contract civilians, they were considered secondary workers and their economic effects were accounted for by including the contract amount in the base procurement expenditures. Input-output sectors were selected to reflect the anticipated spending profiles associated with the alternatives in order to make a reasonable estimate of the general magnitude of their economic characteristics within the ROI. The sectors used in the analysis are listed in Table B-2.

Table B-2. Total Employment Aggregated to Nine Input/Output Sectors, Proposed Action

	2000	2005	2015
Agriculture and Mining	62	110	208
New Construction	114	114	114
Maintenance/Repair	72	107	177
Manufacturing	966	1,925	3,844
Transportation and Utilities	1,610	3,196	6,371
Wholesale Trade	52	100	195
Retail Trade	426	807	1,568
Finance/Insurance/Real Estate	87	165	323
Services/Other	1,330	2,410	4,568
Total	4,717	8,934	17,366

The number of in-migrating workers associated with each alternative and out-migrating workers associated with phase-down of base operations were estimated according to a set of proportional assumptions. The percentages were extrapolated from assumptions developed by Spiegel and Hewings (1989) for a study of the closure of Chanute AFB in Rantoul, Illinois.

It is estimated that 95.0 percent of the military personnel would leave the area when the base closes. Many appropriated fund employees are in specialized positions, which increases the likelihood of migration from the area. Nonappropriated fund employees are typically in less-skilled positions, are employed in support functions such as recreation and commissary sales, and are less likely to out-migrate. Contract employees generally are employed under service contracts at the base, such as for housing area maintenance. Many of these workers are in craft positions of varying skill levels, which decreases the likelihood of out-migration. Secondary workers would be employed principally in retail and service jobs and would be less likely to out-migrate. Retired military personnel are likely to move out in modest proportions due to loss of services customarily provided by the base.

Out-migration assumptions and base closure calculations illustrating their use are presented in Table B-3.

Table B-3. Out-Migrating Workers and Population by Employment Category, 1992

Employment Category	Site-Related Employment and Retirees	Percent Relocating from Region	Out-Migrating Employees	Household Size	Out-Migrating Population
Military	3,657	95.0[a]	3,480	2.57[b]	8,958
Civilian	2,081	39.4	820	2.91	2,387
Appropriated Fund	525	75.0	394	2.91	1,147
Nonappropriated Fund	385	50.0	192	2.91	559
Secondary[c]	1,171	20.0	234	2.91	681
Subtotal	5,738	74.9	4,300	2.64[d]	11,345
Retired Military	964	20.0	193	2.00	386
Total	6,702	67.0	4,487	2.61[e]	11,731[f]

Notes: Columns may not total due to rounding.

(a) The analysis assumed 95 percent out-migration rate for the military; the remaining 5 percent of on-base residents were allocated to surrounding communities based on distribution of civilian direct employees (Table B-5), resulting in an actual out-migration of approximately 95.2 percent.

(b) Military out-migrating population of 8,958 is 95 percent of the 9,430 reported in U.S. Air Force, 1992a. Household size of 2.5741 calculated for presentation here.

(c) Includes contract civilians due to lack of payroll data to calculate their direct economic effects.

(d) Household size of 2.6384 is a weighted average of military and civilian personnel calculated for this presentation.

(e) Household size of 2.6144 is a weighted average of military, civilian, and retired military personnel calculated for this presentation.

(f) Includes 150 persons residing outside the two-county Region of Influence.

Sources: Spiegel and Hewings, 1989; U.S. Air Force, 1992a; U.S. Bureau of the Census, 1991b.

The calculation of out-migrating workers and dependents presented in Table B-3 is based on the effects of closing the base with only the OL remaining behind to maintain the base property. Site-related workers and retirees are presented by labor category for the preclosure reference year of 1992. The net employment losses are presented by each labor category for 1992. The percentages of workers expected to move out of the ROI ranged from 20.0 percent to 95.0 percent, depending on the type of position vacated. Out-migrating employees were calculated by multiplying the number of personnel by the assumed relocation percentage in that job category. The number of out-migrating employees times the average household size in that category determined the out-migrating population.

As the number of base operations personnel declines to zero by 1995, all out-migrating employees and dependents are projected to leave the area. This analysis projects that 74.9 percent of the site-related employees will move out of the ROI with closure of the base. This percentage is the weighted average of 95.0 percent of all military personnel, 75.0 percent of the appropriated fund workers, 50.0 percent of the nonappropriated fund workers, and 20.0 percent of secondary civilian workers out-migrating. If the 20.0 percent of military retirees expected to move out of the ROI is added, a total of 67.0 percent of site-related persons will out-migrate.

Assumptions for in-migrating workers are similar to those for out-migrating assumptions. No jobs were projected to be 100.0 percent filled by in-migrating workers since this would imply that no persons with the necessary skills were available in the ROI to perform these jobs. Direct on-site operations jobs were assumed to require skill levels similar to those of civil service personnel. Construction workers were expected to be readily available in the area, though supervisory and highly skilled craft workers may be more likely to move in from outside the ROI. Relatively few secondary workers would move in from outside the ROI due to ready availability of suitable workers in the local labor force. Assumptions for in-migrating workers and calculations for the Proposed Action in 2015 are presented in Table B-4.

Average household size assumptions were specific to each type of employment including direct and secondary jobs by category. Most civilian households were assumed to correspond with the average size of state-to-state migrating families between 1980 and 1985 (2.91 persons per household; U.S. Bureau of the Census, 1987a). For out-migrating military families, the number of personnel and dependents was based on K. I. Sawyer AFB personnel records. For retired military personnel, the average household size was assumed to be 2.00.

The calculations presented in Table B-4 indicate the nature of the analysis performed for the worker and population in-migration effects of reuse. Site-related employment by category was projected for each year of the analysis.

Table B-4. In-Migrating Workers and Population by Employment Category, Proposed Action 2015

Employment Category	Site-Related Employment	Percent Relocating to Region	In-Migrating Employees	Household Size	In-Migrating Population
Direct Operations	9,744	30.0	2,923	2.91	8,506
Construction	159	10.0	16	2.91	47
Secondary	7,463	5.0	373	2.91	1,085
Total	17,366	19.1	3,312	2.91	9,638

Note: Data in this table exclude projected natural increase of 1,352 persons from closure to 2015. Total migratory-related population effect in 2015 is 10,990 persons, of which 10,483 would locate within the Region of Influence.

Source: U.S. Bureau of the Census, 1987a.

Worker in-migration assumptions were then applied to these job projections. The resulting figures represented the number of workers who would be in the ROI (in that year, for that employment category, under that alternative), who would not have been in the ROI without the Proposed Action or other alternatives. This number of workers, when multiplied by the average household size for that worker category, determined the number of persons in the ROI in that year who would not have been there without the Proposed Action or other alternatives an average of 19.1 percent of all workers holding site-related jobs was projected to live in the ROI with the Proposed Action and who would not live there without the Proposed Action. These may be either persons who move into the ROI to take a site-related job, or refrain from moving out of the ROI due to availability of site-related employment when they otherwise would leave. The data in Table B-4 exclude the effects of natural increase in population, which are discussed under population methods below.

Out-migration and in-migration were assumed to occur during the same year in which their associated job changes took place. Retirees leaving the area were assumed to move out upon closure of the base.

The assumptions specified in Tables B-3 and B-4 were judged, based on prior Air Force base closure and reuse socioeconomic studies, to be the most likely values applicable to this study. Other assumptions could result in either higher or lower population effects than those resulting from the assumptions specified. Such outcomes are certainly possible but their likelihood is difficult to assess.

The next step in the analysis was to allocate or assign the ROI-level effects on in-migrating and out-migrating workers to areas (counties and communities) within the ROI. This was done using the data presented in Table B-1, the 1990 area population, and the factors discussed above in the definition of the ROIs for this study. This intra-regional allocation analysis

separately accounted for the distribution of direct and secondary workers and their families among the various residential areas within the region.

The relative attractiveness of residential areas was estimated from K. I. Sawyer AFB personnel files of civilian workers (see Table B-1). The residential choices of the direct in-migrating workers to the area were anticipated to coincide with the residential choices of the K. I. Sawyer AFB civilian personnel in 1993. This assumption was based on the expectation that the attractiveness of each residential location, including attributes such as adequate public and commercial services and proximity to work location, would best be measured by the revealed preferences of base civilian workers.

Table B-5 shows the percentages of out-migrating or in-migrating workers (military personnel, other direct workers, and secondary workers) allocated to or from each local area (communities and counties). These spatial allocation percentages were calculated from the sample of base residential data presented in Table B-1 and 1990 area population data. Military out-migrating (first column of data) were projected to move out of the areas in which they were known to reside, including the base itself and areas around the base. Direct civilian base employees (second column of data) were projected to move out of the areas around the base in proportion to their known pattern of residence. Secondary employees leaving the area whose jobs were dependent on spending of direct military and civilian employees (third column of data) were projected to out-migrate from areas around the base in the same spatial proportions as direct civilian workers. Secondary workers leaving the area whose jobs depended on the purchases of goods and services by the base (fourth column of data) were projected to leave areas within the ROI in proportion to the overall 1990 pattern of off-base population settlement in the ROI. This fourth column of data was calculated from the 1990 population data, excluding the on-base resident population. Retirees were projected to move out of areas around the base in proportion to their known pattern of residence.

Workers moving into the ROI to take site-related jobs under the reuse alternatives were spatially allocated to areas within the ROI using these same proportionate distributions. Direct workers were assigned to areas on the basis of the 1993 residential distribution of direct civilian workers at the base. Secondary workers dependent on direct worker spending were allocated within the ROI using the same distribution as for direct workers. Secondary workers dependent on goods and services purchases by establishments on the site were allocated within the ROI on the basis of the 1990 off-base ROI population distribution.

Table B-5. Intra-ROI Distribution of Workers and Retirees Related to K. I. Sawyer AFB

County and Township	Military (percent)	Civilian Direct (percent)	Civilian Secondary (percent)		
			Worker Spending	Goods and Services	Retirees
Marquette County	99.4	85.0	85.0	65.2	76.5
Forsyth Township	58.9	39.9	39.9	8.1	24.5
Sands Township	14.0	8.4	8.4	2.5	5.2
West Branch Township	19.6	5.4	5.4	2.1	4.3
City of Ishpeming	0.3	2.9	2.9	6.6	5.2
City of Marquette	3.9	12.4	12.4	20.2	18.4
City of Negaunee	0.3	4.5	4.5	4.3	2.9
Rest of County	2.4	11.5	11.5	21.4	16.0
Delta County	0.2	10.1	10.1	34.8	23.5
Outside of ROI	0.4	4.9	4.9	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

ROI = Region of Influence

Sources: U.S. Air Force, 1993b; U.S. Bureau of the Census, 1991b.

Population

Population changes associated with preclosure and post-closure without reuse (No-Action Alternative) and the reuse alternatives are an important determinant of other socioeconomic and environmental effects. These population changes have three key components: (1) baseline growth, (2) relocation of workers and their dependents, and (3) natural increase of population (births minus deaths) over the long term.

Population trends for the ROI were prepared by NPA Data Services, Inc. These projections were made in 1993, assuming continued operation of K. I. Sawyer AFB within the ROI. The forecasts were adjusted to reflect the effects of base closure by subtracting the estimated population loss expected from closure of the base.

The relocation of workers in response to closure and subsequent reuse was determined by utilizing the methods and assumptions discussed under economic activity. The number of dependents expected to relocate with these workers was estimated based on household sizes derived from census demographic data and K. I. Sawyer AFB personnel records (see Tables B-3 and B-4) (U.S. Bureau of the Census, 1987a; U.S. Air Force, 1993b).

The natural increase in population (resulting from births in excess of deaths) was based on the actual natural increase experienced in the two-county ROI

between 1980 and 1990 (Wang, 1994), which averaged 0.7 percent per year. This natural population trend is expected to continue for the 20-year period beginning at base closure.

To evaluate anticipated population effects, projected ROI population with reuse was compared to changes projected without reuse. The numerical comparison of growth rates under these future projections was used as a basis for assessing the effects of reuse relative to the No-Action Alternative. Population changes at the ROI level and in the townships of Forsyth, Sands, and West Branch; the cities of Ishpeming, Marquette, and Negaunee; and Marquette County received primary emphasis in this analysis.

Housing

The population changes associated with closure and reuse would result in further changes in housing demand. Housing demand effects of closure and reuse were estimated from migration projected for the reuse alternatives, assuming one household per worker and assuming each in-migrating household would require one unit and each out-migrating household would relinquish one unit. Only the off-base portion of the out-migrating population was used for estimating the closure housing demand changes. The number of relocating households was calculated by dividing the number of people projected to in-migrate by the average family size of state-to-state migrating families (U.S. Bureau of the Census, 1987a).

To assess the effect of reuse on local housing conditions, projected growth in total housing demand for the ROI and for Forsyth, Sands, and West Branch townships; the cities of Ishpeming, Marquette, and Negaunee; and Marquette County, under the Proposed Action and alternatives and compared with the No-Action Alternative.

Public Services

Potential effects on local public services due to changes in demand associated with closure and reuse of K. I. Sawyer AFB were determined for the region's key public services: general government, public education, police protection, fire protection, and health care. Effects were determined for the jurisdictions that have the closest linkages to K. I. Sawyer AFB (and base military and civilian personnel and their dependents), as well as jurisdictions likely to be most affected by reuse of the base.

Several key assumptions regarding future jurisdictional control of base property were made in determining the effects on public services. These assumptions also apply to assessment of effects on public finance. Under the No-Action Alternative, ownership of the base property remains with the U.S. Government, and OL activities include provision of security and maintenance of on-site facilities. Under the reuse alternatives, ownership

would eventually pass to private organizations and/or state and local government entities. Local governments would be responsible for providing needed public services.

The levels of general public service were determined by considering the population size of each jurisdiction (county, city/town, township, and school district), the land area of the jurisdictions served, and, in some instances, the minimum level of service needed to maintain government functions.

Greatest emphasis was placed on the population served using ratios of employees (e.g., municipal employees, sworn officers, fire fighters) to population served and student/teacher ratios at the primary and secondary public school levels. Preclosure year (1992) level-of-service ratios were determined for each affected jurisdiction.

These service ratios were used to estimate jurisdiction-specific future requirements for service, reflecting the assumption that local governments would exercise flexibility in providing services to accommodate changes in area population. For example, schools may choose to close facilities or combine classes in response to lower enrollments and lower funding levels, police and sheriff departments may reassign officers if reduced area population results in staff cuts, and general government functions may be performed with more part-time or on-call personnel and fewer full-time employees.

Ratios of employees to jurisdiction land area or developed land area were used to calculate possible additional requirements for personnel based on the added on-base land area to be served (area-generated effects).

Projected changes in public school enrollments were estimated based upon the results of the population analysis. The number of future public school instructors that would be required was based on enrollment projections and preclosure student/teacher ratios. The number of future public-sector employees needed to meet future demand and maintain preclosure levels of service for other public services was determined using projected population changes and preclosure level-of-service ratios.

Finally, the analysis examined the geographical distribution of potential effects. Because of the magnitude of some effects of closure and reuse, past level-of-service ratios may not adequately meet new service requirements. Changes in land area served and types of services to be provided were considered. Discussions with staff at key local agencies were used to assess these particular factors.

Public Finance

Local jurisdictional finances were evaluated based on changes in historic revenue and expenditure levels, changes in fund balances, and assessed valuations. The analysis concentrated on each jurisdiction's governmental funds (general fund, special revenue funds, and, as applicable, capital projects and debt service funds). Other funds, such as enterprise funds that are funded principally through user charges without contributing to the general tax burden of area residents, have not been included in the analyses.

Post-closure conditions (assuming closure and caretaker status of K. I. Sawyer AFB) and effects of the reuse alternatives (assuming base reuse) were determined by:

- Population increases (or decreases) in each jurisdiction, including school districts
- Potential changes in each jurisdiction's property tax base
- Changes in federal transfers due to closure of the base (particularly losses in Public Law 81-874 funds).

Revenue effects were estimated for both the tax and non-tax revenue sources of each jurisdiction. Changes in tax revenue were estimated for the major types of taxes collected by the local jurisdiction, and are based on the change in the tax base resulting from closure or reuse (e.g., changes in assessed valuation) and the effective tax rate associated with that tax source (e.g., the property tax rate applicable to each jurisdiction). Non-tax revenue effects such as changes in service charges, intergovernmental transfers, fines, fees, and miscellaneous revenues were estimated on a total or per capita basis.

Per capita rates for the revenue sources, assumed to change in response to changing population levels, were calculated using preclosure fiscal year (FY) 1992 values for each revenue source analyzed in each jurisdiction and the estimated population in each jurisdiction for that year. Receipts for each revenue source in each jurisdiction were divided by the estimated population in that jurisdiction for that year.

Some revenue sources were not expected to respond to changes in population and were treated differently from sources which would respond to population changes. In particular, miscellaneous revenues include interest earnings, which would not be affected by changing population levels. Exact portions of miscellaneous revenues attributable to interest earnings were not known for every jurisdiction. Per capita miscellaneous revenue rates were, therefore, reduced by 50 percent to account for the expected lack of change in interest revenues.

Expenditure effects were estimated based on the historic (FY 1992) per capita costs of the principally affected service functions of each jurisdiction. These functions include law enforcement, fire protection, recreation, and others. Per capita costs were multiplied by the estimated change in the population base of each jurisdiction. Certain functions such as general government administration and public safety, as examples, were assumed to exhibit some economies of scale. Rates for these functions were lowered to reflect the potential savings for these services. Any potential increases in per capita costs due to added land area served, independent of changes in population, would be in addition to the expenditures projected in this study.

Net fiscal effects or shortfalls are based on the projected increase (or decrease) in revenues minus the projected increase (or decrease) in expenditures.

It is uncertain to what extent the redevelopment powers of the K. I. Sawyer Base Conversion Authority will be utilized in reuse activities at the base. Declaration of the base as a redevelopment project would result in any incremental property tax revenues generated by the conversion of portions of the base to private ownership being credited to the redevelopment agency and not to the local jurisdictions within whose boundaries the base is located (i.e., Forsyth, Sands, and West Branch townships). For purposes of this analysis, it is assumed that the base area is not formally declared a redevelopment area and any property tax revenue generated by conversion of portions of the base to private ownership would accrue to those jurisdictions within whose boundaries the base is located.

Since passage of the Michigan school financing reforms in March 1994, the state has assumed the responsibility of providing funding for basic education programs at the local level. Minimum funding is guaranteed at $4,200 per pupil and would come from a statewide property tax and increases in sales and other tax and non-tax revenue. To offset the closure deficit, the school districts may institute service cutbacks or develop new revenue sources from the state or local area.

Transportation

The transportation network of the ROI was examined to identify potential effects to levels of service (LOS) arising from closure conditions (caretaker status of K. I. Sawyer AFB) and effects of reuse alternatives. Changes in traffic volumes and peak-hour LOS ratings were projected for road segments (excluding intersections and highway ramps). LOS ratings were based on Highway Capacity Manual recommendations (Transportation Research Board, 1985).

Effects on roads in the ROI were measured in terms of the changes in the number of vehicles traversing uniform sections of roadway. To measure

these changes, traffic volumes (including projected reuse-related traffic) were compared to the capacity of the road segment and determined as a ratio (known as volume-to-capacity ratio). The capacity of a roadway is defined as the maximum hourly rate at which vehicles can pass a uniform section of roadway traffic under prevailing roadway, traffic, and control conditions.

Traffic volumes typically are reported as either the daily number of vehicular movements in both directions on a segment of roadway averaged over a full calendar year (average annual daily traffic [AADT]), or the number of vehicular movements on a road segment during the average peak hour. The average peak-hour volume for urban areas typically is about 10 percent of the AADT (Transportation Research Board, 1985). These values are useful indicators in determining the extent to which the roadway segment is used and in assessing the potential for congestion and other problems.

Traffic flow conditions are generally reported in terms of LOS, rating factors that represent the general freedom (or restriction) of movement on roadways (Table B-6). The LOS scale ranges from A to F, with low-volume, high-speed, free-flowing conditions classified as LOS A. LOS E is representative of conditions that, although not favorable from the point of view of the motorist, provided the greatest traffic volume per hour. With minor interruptions, however, LOS E will deteriorate to LOS F (Transportation Research Board, 1985).

Table B-6. Road Transportation Levels of Service

LOS	Description	Criteria (Volume/Capacity)
		2-Lane Highway
A	Free flow with users unaffected by presence of other users of roadway	0.10
B	Stable flow, but presence of the users in traffic stream becomes noticeable	0.11 - 0.23
C	Stable flow, but operation of single users becomes affected by interactions with others in traffic stream	0.24 - 0.39
D	High density, but stable flow; speed and freedom of movement are severely restricted; poor level of comfort and convenience	0.40 - 0.57
E	Unstable flow; operating conditions at capacity with reduced speeds, maneuvering difficulty, and extremely poor levels of comfort and convenience	0.58 - 0.94
F	Forced breakdown flow with traffic demand exceeding capacity; unstable stop-and-go traffic	0.94

LOS = Level of Service
Source: Compiled from Transportation Research Board, 1985.

LOS ratings presented in this study were determined by peak-hour traffic volumes and capacity for key roadways.

Traffic volumes for the study area were derived from the AADT counts provided by the Michigan Department of Transportation, Marquette County Highway Department, and Michigan State Police. Changes in traffic volumes arising from land use changes at K. I. Sawyer AFB were estimated, and resulting volume changes on the local road network were determined. Resulting changes in peak-hour LOS ratings were then determined. Changes in work and associated travel patterns were derived by assigning or removing workers (by place of residence) to or from the most direct commuting routes. Those portions of the transportation system on which conditions were projected to decline to LOS F were assumed to be upgraded to support LOS E. These improvements were assumed to be part of the reuse alternative under analysis.

Changes in demand for air and rail freight, arising from closure and reuse of the base, were determined from data developed for each alternative.

Additional information on methods used in the transportation analysis is presented in Appendix E of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan.

Utilities

The utility systems addressed in this analysis include the facilities and infrastructure used for:

- Potable water pumping, treatment, storage, and distribution
- Wastewater collection and treatment
- Solid waste collection and disposal
- Energy generation and distribution, including the provision of electricity and natural gas.

For the reuse alternatives, local purveyors of potable water, wastewater treatment, and energy were anticipated to provide services within the area of the base, and these entities would acquire most or all related on-site utilities infrastructure and distribution equipment. It was also assumed that reuse activities would generate solid wastes that would be disposed of in area landfills.

Long-term projections of demand and population were obtained from the various utility purveyors within the ROI. In each case, the most recent comprehensive projections were used; these projections were made prior to

the base closure announcement and/or do not take into account a change in demand from the base. These projections, therefore, were adjusted to reflect the decrease in demand associated with closure of K. I. Sawyer AFB and its subsequent operation under caretaker status. The adjusted forecasts were then considered the baseline for comparison with potential reuse alternatives.

The potential effects of reuse alternatives were evaluated by estimating and comparing the additional direct and indirect demand associated with each alternative to the historic and projected operating capabilities of each utility system. Projections in the utilities analysis include demand for water, wastewater treatment, solid waste disposal, electricity, and natural gas for K. I. Sawyer AFB property from activities planned under the reuse alternatives, as well as resulting changes in domestic demand associated with direct and indirect population changes in the ROI.

A detailed description of methods used for the utilities analysis is found in Appendix E of the Environmental Impact Statement, Disposal of K. I. Sawyer Air Force Base, Michigan.

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APPENDIX C

APPENDIX C

GLOSSARY OF TERMS AND ACRONYMS/ABBREVIATIONS

GLOSSARY OF TERMS

Aggregate. A summation of values.

Arterial. Signalized street that serves primarily through-traffic and provides access to abutting properties as a secondary function.

Average Annual Daily Traffic (AADT). For a 1-year period, the total volume passing a point or segment of a highway facility in both directions, divided by the number of days in the year.

Biophysical. Pertaining to the physical and biological environment, including the environmental conditions crafted by man.

Capacity (transportation). The maximum rate of flow at which vehicles can reasonably be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions.

Capacity (utilities). The maximum load a system is capable of carrying under existing service conditions.

Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). A co-payment medical plan that provides coverage for specific medical services to eligible dependents of active duty, retired, or deceased military personnel. CHAMPUS pays approximately three-fourths of the cost of medical services and is honored by hospitals, clinics, and doctors nationwide.

Commercial aviation. Aircraft activity licensed by state or federal authority to transport passengers and/or cargo for hire on a scheduled or nonscheduled basis.

Constant 1992 Dollars. The transformation of current-year dollars into 1992 dollars using an appropriate deflator index to eliminate the effects of inflation and allow for comparability over time.

Convey. To deliver title of property to a nonfederal entity.

Developed. An area of land that has been built upon or where public services have been installed prior to residential or commercial construction.

Direct effect. Effects resulting solely from a program, project, or action and immediately related to the program, project, or action in space or time.

Effects/impacts. An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the effects, usually measured using a qualitative and nominally subjective technique. In environmental impact statements, as well as in the Council on Environmental Quality regulations, the word "impact" is used synonymously with the word "effect."

Employment. The total number of full- and part-time jobs held by wage and salary workers, both civilian and military, as well as farm and non-farm proprietors.

Enterprise fund. One of the proprietary fund types used to account for activities that are financed primarily through user charges.

Environmental Impact Analysis Process. The process of conducting environmental studies as outlined in Air Force Instruction 32-7061.

Expenditure. A disbursement of funds by a government entity; includes operation and maintenance costs, as well as capital costs.

Fiscal year. In government finance, the 12-month period that corresponds to the jurisdiction's accounting period. The federal fiscal year is October 1 through September 30; local and state government fiscal years vary from jurisdiction to jurisdiction.

Fund balance. Resources remaining from prior years, which are available to be budgeted in the current year.

General aviation. All aircraft that are not commercial or military aircraft.

General fund. General operating fund accounting for all financial resources except those required to be accounted for in other funds.

General obligation bonds. Bonds backed by the full faith and credit (which includes taxing and further borrowing power) of a jurisdiction. It is repaid by voter-approved increases in local property tax rates, in contrast to revenue bonds, which are paid back by the revenue generated by operation of a specific facility built with the borrowed funds (e.g., a sewage treatment plant).

Infrastructure. The basic installations and facilities on which the continuance and growth of a locale depend (e.g., roads, schools, power plants, transportation, communication systems).

Interstate. The designated National System of Interstate and Defense Highways located in both rural and urban areas; they connect the East and West coasts and extend from points on the Canadian border to various points on the Mexican border and Gulf of Mexico.

Level of service. In public services, a measure describing the amount of public services (e.g., fire protection and law enforcement services) available to community residents; generally expressed as the number of personnel providing the services per 1,000 population. Level of service may also be expressed in terms of land area (i.e., usually as number of acres per person providing the service).

Level of Service (LOS). In transportation analyses, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.

Megawatt-hours. A unit of energy equivalent to 1 million watt-hours.

Mill. One-tenth of a cent.

Mutual Aid Agreement. An informal or formal, non-paid agreement among providers of public services, which commits municipalities to provide assistance generally on an as-available and as-needed basis, to other municipalities.

National Environmental Policy Act (NEPA). Public Law 91-190 passed by Congress in 1969. The Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the Council of Environmental Quality. NEPA procedures require that environmental information be made available to the public before decisions are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

Operating Location (OL). An organization established by the Air Force to ensure base resource protection, grounds maintenance, utilities operations as necessary, and building care.

Out-migration. The act of leaving one region or community in order to settle in another.

Peak Hour. The hour of highest traffic volume on a given section of roadway between 7:00 a.m and 9:00 a.m., or between 4:00 p.m. and 6:00 p.m.

Public Law (P.L.) 81-874. A federal law that authorizes financial assistance for local school districts upon which the United States has placed financial burdens as the result of the acquisition of real property by the United States; a sudden and substantial increase in enrollment as the result of federal activities; or due to the need to provide education for children residing on federal property or whose parents are employed on federal property.

Sales tax. A tax placed on goods or services at the time of their purchase.

Secondary effects. Effects (usually employment, population, and income/spending changes) caused by a program, project, or action, but removed from the program, project, or action in space or time.

Secondary employment. The additional employment generated by the economic activity required to produce the inputs to meet the initial changes in demand. The term is often used to include both indirect and induced effects.

Section 3(e) Transition Entitlements. Special impact aid program authorized under Public Law 81-874 for continued funding of federal impact aid to a local school district even after the district becomes ineligible under general program guidelines. Provides authority for continued impact aid when a decrease or cessation of federal activities in an area results in a substantial decrease in the number of children eligible for such aid. Payments would be for a period of 1 year and are subject to congressional appropriation.

Shortfall. The difference between projected local government expenditures and revenues when the projected expenditures are greater than projected revenues.

Single-family Housing. A conventionally built house consisting of a single dwelling unit occupied by one household.

Site-related. A group that is directly or indirectly related to the base property. For example, site-related population in a reuse alternative refers to all employees, direct and secondary, and their dependents associated with the reuse.

Special Revenue Fund. A fund that accounts for the proceeds of specific revenue sources that are legally restricted to expenditures for specified purposes.

Surplus Property. Property designated as excess that is of no interest to any federal agency. These properties are made available to state, local, or non-profit organizations or sold to private organizations.

Transfer. To deliver title of property to another federal agency.

U.S. Environmental Protection Agency (EPA). The independent federal agency established in 1970 that regulates environmental matters and oversees the implementation of environmental laws.

Watt. A unit of electrical power equal to 1/746 horsepower.

ACRONYMS/ABBREVIATIONS

AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
ATC	Air Traffic Control
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
CR	County Road
DBCRA	Defense Base Closure and Realignment Act
DOD	Department of Defense
EIS	Environmental Impact Statement
EMT	Emergency Medical Technician
ERIS	Economic Resource Impact Statement
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
FTE	full-time equivalent
FY	fiscal year
ILS	instrument landing system
LOS	Level of Service (transportation)
MANG	Michigan Army National Guard
MGD	million gallons per day
MMCF	million cubic feet
MWH	megawatt-hours
NEPA	National Environmental Policy Act
NMU	Northern Michigan University
NPDES	National Pollutant Discharge Elimination System
OL	Operating Location
PAPI	precision approach path indicator
P.L.	Public Law
RAPCON	Radar Approach Control
RIMS	Regional Input-Output Multiplier System
RN	registered nurse
ROI	Region of Influence
RPZ	runway protection zone
SH	State Highway
SIAS	Socioeconomic Impact Analysis Study
UPPCO	Upper Peninsula Power Company
U.S. #	U.S. Highway
VA	Veterans Administration
VAQ	Visiting Airmen's Quarters
VFR	visual flight rule
VOQ	Visiting Officer's Quarters
VOR	Very High Frequency Omnidirectional Range
WWTP	wastewater treatment plant

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